SUPPORTING MULTI-MORBIDITY SELF-CARE THROUGH INTEGRATION, LEARNING AND EHEALTH (SMILE 2)

Final Evaluation Report

JANUARY 1, 2025

HSE ECC Programme and Caredoc

Sláintecare. Rialtas na hÉireann Government of Ireland pobal government supporting communities

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Executive Summary

The SMILE 2 project (Supporting Multi-morbidity self-care through Integration, Learning and eHealth) provides integrated virtual case management and remote monitoring of patients with multimorbid chronic disease in the South East portion of HSE Dublin and South East, to a population of 500,000. The project is a joint initiative between the HSE's Enhanced Community Care (ECC) programme together with the Chronic Disease Community Specialist Teams (CD CSTs) partnering with Caredoc.

The virtual case management of multi-morbid patients is an essential element of the Integrated Care Programme for the Prevention and Management of Chronic Disease (ICPCD) clinical Model of Care, and hence an essential part of the ECC. SMILE 2 provided services for 600 patients, as an appropriate model for a population of 500,000. The project has developed scalable processes and guidelines, providing a blueprint for a national case management service that maximizes the efficient use of nursing resources.

The purpose of the project is to reduce patient episodes of unscheduled care by empowering people with chronic disease to proactively self-manage their chronic diseases including support to identify and prevent exacerbations of symptoms. SMILE 2 covers a total of eight chronic diseases including the most prevalent chronic diseases (CVD, Diabetes Type 2, COPD and Asthma).

SMILE 2 provides care closer to home through the remote monitoring of vital signs and wellbeing, the integration with the ECC Programme ensures a fully integrated and holistic service is provided for patients. The patient is empowered to self manage their condition with support from the SMILE 2 triage nurse. The triage nurse responds to alerts received through the ProACT application, if further specialist input is required, the triage nurse will contact the appropriate service/clinician such as the CST, ensuring integration of services and decreasing the likelihood of the patient requiring acute hospital services. This reduction in healthcare utilisation underscores the effectiveness of the project in preventing health exacerbations and managing chronic conditions within the community.

The project has shown improved objectively measured health and wellbeing and stabilisation of symptoms in the patients enrolled for a number of months. This has led to the demonstrated substantial reductions in health care utilisation by this cohort of patients.

- 55% reduction in the total number of Emergency Department (ED) visits.
- 75% reduction in the number of bed nights used.
- 81% reduction in the % of patients who attended an unscheduled urgent GP visit.

Patients attribute these reductions to their improved ability to identify deterioration of their condition early and having the knowledge and confidence to act to avert it, aided by advice from the telephone triage nurse. Overall, 72% of patients achieved stabilisation of the symptoms of their chronic diseases, this finding demonstrates the success of patient education and remote monitoring in supporting those with multi-morbidity to successfully manage their chronic diseases within the community.

The programme has integrated well with the CST in the region and the clinicians share pathways and technology in providing integrated care for patients. The programme is well liked by HSE staff, GPs and 94% of patients agree the programme has improved their health and wellbeing. The project has shown that virtual case management and remote monitoring effectively intervene in high-risk multimorbid patients, supporting the development of a population health management system in Ireland.

1. Introduction

This final evaluation report December 2024 of the SMILE 2 Project, reports on the first 2 years of operation of the project from 1st January 2023 to 31st December 2024.

It is estimated that there are 1.3 million people in Ireland currently with one of the 4 main chronic diseases (CVD, Diabetes Type 2, COPD and Asthma). People with chronic disease have frequent visits and often present late to the Emergency Department (ED), the Acute Medical Assessment Unit (AMAU) and to both GP day services and the GP out of hours service. This leads to suboptimal outcomes for patients. The Integrated Care Programme for the Prevention and Management of Chronic Disease (ICPCD) clinical Model of Care outlines 5 levels of service which are necessary to care for these patients. It is estimated that between 1% and 5% of people with chronic disease will require a case management service i.e., between 13,000 and 65,000 individuals in Ireland.

The SMILE 2 project (Supporting Multi-morbidity self-care through Integration, Learning and eHealth) provides integrated virtual case management of patients with multimorbid chronic disease in Community Healthcare South East (CHO 5) which consists of counties Waterford, Wexford, Carlow, Kilkenny and South Tipperary. The purpose of the project is to reduce episodes of unscheduled care by empowering people with chronic disease to proactively self-manage and hence identify and prevent their exacerbations, which will lead to reduced unscheduled care usage.

The SMILE 2 project is a joint initiative between the HSE Enhanced Community Care (ECC) programme together with the Chronic Disease Community Specialist Teams (CD CSTs) partnering with Caredoc. The virtual case management of multi-morbid patients is an essential element of the ICPCD clinical Model of Care, and therefore plays a vital role within the framework of the ECC Programme. The project utilises ProACT/NetwellAdmin software, a digital platform developed by researchers in NetwellCASALA at Dundalk IT and the TCPHI at Trinity College Dublin.

The project builds on the success of the stand-alone prototype of this service, successfully demonstrated and mainstreamed as the SMILE 1 project under the Sláintecare Integration Fund (SIF 1, 2019-2021). SMILE 1 was an efficient and clinically effective virtual case management service. Good practice now requires the integration of such services with the mainstream clinical services, as part of the end to end ECC model.

SMILE 2 aims to integrate the service into the ECC Programme, and ensure that it is nationally scalable. This entails Caredoc personnel working closely with the new Integrated Care Consultants, GPs and CD CST staff and hospital nurses, together with Allied Health and Social Care Professionals. The clinicians identify and refer patients from the population that need more intense case management support. SMILE 2 needs to be scalable and affordable and so must be delivered virtually. The objectives of the SMILE 2 project align closely with the goals of Sláintecare, focusing on transforming healthcare delivery in Ireland.

Project Objectives

- Through virtual case management and the ProACT digital health platform, patients are empowered to self-manage their chronic conditions. This aligns with

Sláintecare's goal of empowering patients to take an active role in managing their health, leading to improved health outcomes.

- By implementing remote monitoring and integrated community care, SMILE 2 reduces the reliance on hospital-based services, shifting care to the community. This supports Sláintecare's aim to provide more care in the community and reduce unnecessary hospital visits
- The project integrates seamlessly with existing healthcare services through the Enhanced Community Care (ECC) Programme, ensuring a coordinated approach to patient care.
- By developing scalable processes and guidelines, the project provides a framework for national implementation, supporting Sláintecare's vision for a sustainable healthcare model that can be expanded nationwide.
- The project has demonstrated a significant reduction in emergency department visits, hospital bed nights, and GP visits, aligning with Sláintecare's goal to minimize frequent unscheduled care and improve early intervention for chronic conditions.

This report describes the evaluation of the SMILE project, detailing the methods and results for: 1. Healthcare utilisation 2. Engagement with technology 3. Symptom stabilisation and 4. Better health and wellbeing. The findings from the Patient Experience Survey are also described in detail, with high levels of patient satisfaction with the project.

2. Background Information

2.1 Evidenced Based Approach

Identification of multimorbid patients at high risk of hospitalisation and their case management by virtual coaching and remote monitoring is a concept that is in widespread use in developed health services worldwide. Significant improvements in health status and hence reductions in hospital admissions, bed use, and ED attendance have been documented. [1 – 10]

The SMILE programme has demonstrated that virtual case management and remote monitoring is an effective intervention to intervene in high risk multimorbid patients in Ireland. This is an important finding in Ireland to support development of a population health management system.[11]

2.2 SMILE 1

SMILE 1 was successfully developed and implemented by the Caredoc team with funding under the Sláintecare Integration Fund (SIF 1). The objectives were to prevent deterioration in participant conditions, empower citizens to engage with their own health within the community setting, and to avoid hospital admissions.

Caredoc, in conjunction with Dundalk Institute of Technology (NetwellCASALA) and Trinity College Dublin, introduced remote nurse triage support of older adults with multiple conditions, self-managing at home using wearable technology. Monitoring devices included blood pressure monitors, oxygen monitors, weighing scales, and activity monitors (smart watches) which were allocated to participants based on their requirements.

Participants recorded their healthcare data at home and submitted the readings from devices to a specifically designed software programme. Participant alerts were monitored and responded to by the telephone triage nurse and directed if required to the appropriate clinician (e.g. nurse specialist, GP etc.) before their condition deteriorated. The nurses used reminder motivational tools about medication management, and ongoing education on the importance of diet and exercise with patients to improve their self-management and quality of life.

This project was successfully deployed to 150 patients in the community and the evaluation reports showed excellent results [46% reported reduction in unscheduled care episodes (GP visits/ED admissions)]. SMILE 1 is now mainstreamed and operational for patients in Carlow/Kilkenny. The existing cohort of patients from SMILE 1 were migrated to SMILE 2 in May 2023. SMILE 2 focuses on the integration and expansion of the service to an additional 600 patients. The first 300 patients were recruited by April 2024 within the original project budget allocation. The project secured extended funding to recruit an additional 300 patients to the project from April – December 2024.

2.3 Population Health Approach

It is recognised that taking a population health management approach to addressing the care needs of people with chronic disease, requires identifying or stratifying patients according to the complexity of their illness and their service needs. The Model of Care for chronic disease outlines 5 levels of service which are necessary to care for these patients. These levels of services need to be tailored to meet each level of need in an efficient way, both from the expertise required to address the patient's complexity, and the intensity and frequency of service required to support different cohorts of patients.

Patients with significant multimorbidity and disease complexity may require specialist service input but may also require an ongoing relationship with a case manager. The ongoing support provided by case management is additional to that provided by the GP Chronic Disease Management (CDM) programme or the Chronic Disease Community Specialist Teams (CD CSTs). The input of this clinical case manager is often required at a frequency for support and health coaching that could not be delivered by a scarce very specialised resource e.g. Clinical Nurse Specialist (CNS). In SMILE, the specifically trained Caredoc triage nurses provide the case management service at a level of intensity which could not be provided by the community specialist staff. Case management is a resource intensive service if supplied via a face to face method. The use of virtual technology for monitoring and patient engagement allows an efficient use of nursing resources, allowing larger caseloads and facilitating potential large scaling up of the programme throughout the country.

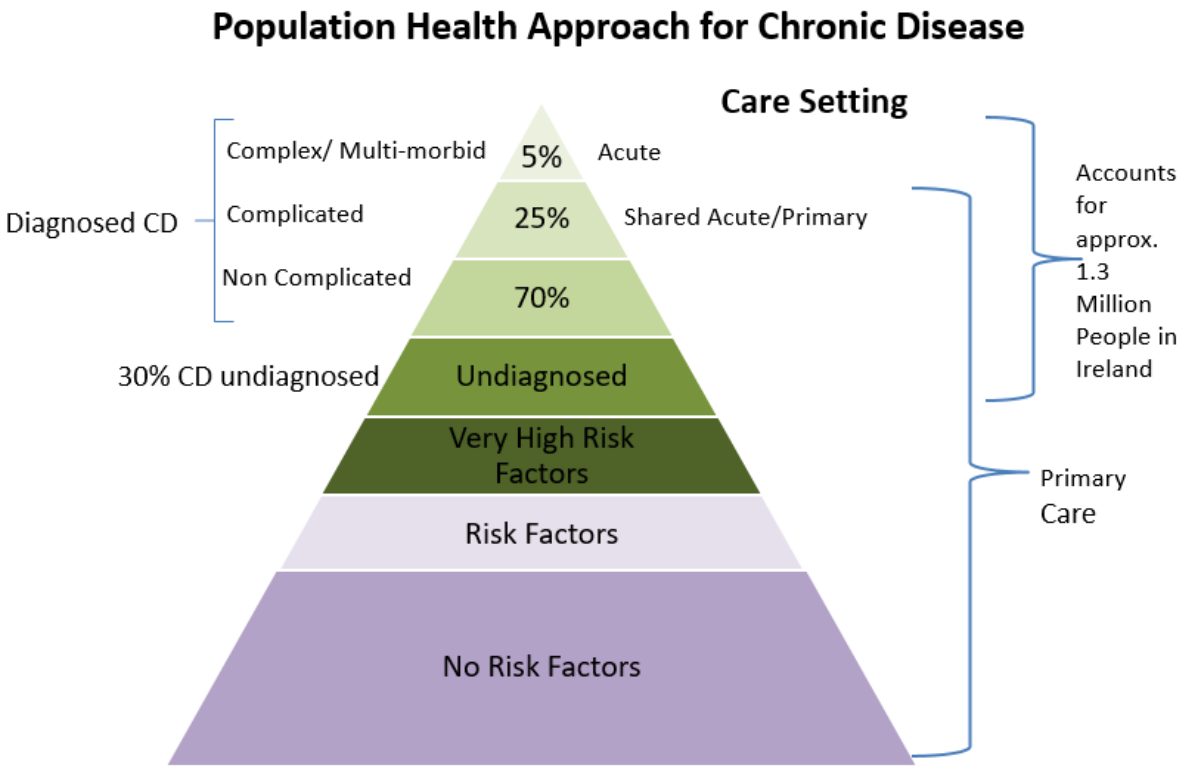


Figure 1: Population Health Approach to chronic disease

2.4 Project Description

The process for patient enrolment is depicted in the below diagram. Potentially suitable patients for inclusion in the programme are identified by their hub-based Clinical Nurse Specialist, GP, Practice Nurse, CD CST or hospital staff. The patient is referred to SMILE using the Patient Consent Form (Appendix 1) and the patient is provided with a patient information leaflet (Appendix 2). The service is provided at no cost to the patient and operates Monday-Friday from 9am-5pm. Once informed consent has been obtained from these patients for data processing, the patient is referred to Caredoc to initiate the initial enrolment process.

This first stage involves a telephone call interview and assessment from a SMILE nurse (Caredoc Triage Nurse) to ascertain that the patient meets the inclusion criteria (Appendix 3) and to determine what technology/hardware they will need to participate in the programme. An account on the ProACT software is created for the patient by the Caredoc Project Officer who will configure the necessary technology and liaise with the patient and the Caredoc Field Operator in arranging a suitable time for a home visit to deploy the digital support kit to the patient.

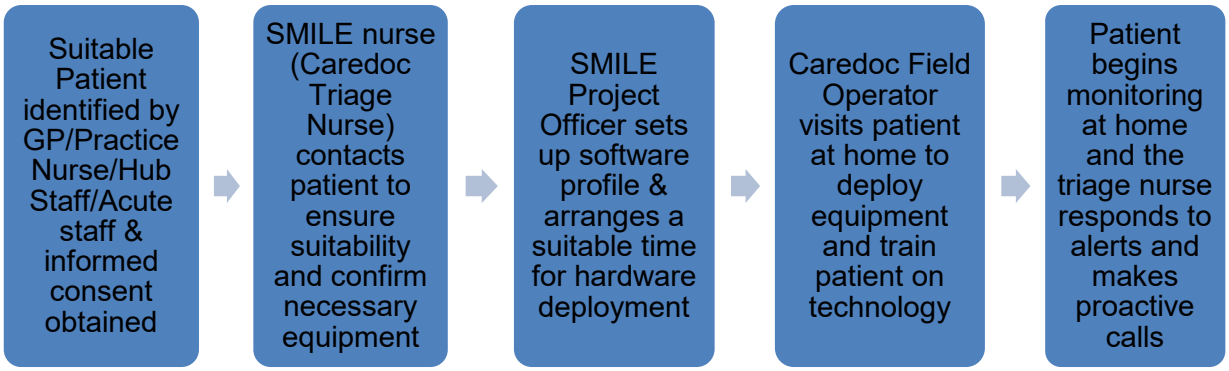


Figure 2: Process for patient enrolment

The SMILE nurse agrees target vital sign parameters with each patient tailored to their condition. The SMILE nurse engages regularly with the patient and reviews their remote monitoring readings. In the case of a patient showing signs of deterioration i.e. exceeding their targets, an alert is raised on the ProACT platform. The SMILE nurse then contacts the patient and assesses the problem. If the triage nurse cannot resolve the problem she liaises as appropriate with the referrer e.g. clinical nurse specialist in the CD CST, to agree the appropriate steps to be taken, ensuring integration of services for the patient. This allows for early intervention and prevention of further exacerbation of a patient's condition, as well as decreasing the likelihood of the patient requiring an unscheduled Emergency Department visit. This process ensures that care is person-centred and supports patients to proactively self-manage their care, leading to improved patient outcomes.

2.5 The ProACT Platform and SMILE 2 project

The SMILE service uses the "ProACT" digital health platform, developed by researchers in NetwellCASALA at Dundalk IT and the Trinity Centre for Practice in Healthcare Innovation (TCPHI) at Trinity College Dublin. The platform has been designed to assist in supporting self-management at home by streamlining and integrating the management of multiple chronic conditions onto a single digital framework.

Participants in the SMILE programme are equipped with a variety of connected devices to monitor their vital signs (e.g. blood pressure, heart rate) and wellbeing (e.g. activity levels, sleep). Data from these devices are transferred over Wi-Fi and collated in the ProACT app, which is installed on each tablet device deployed to participants on enrolment. Within the ProACT app participants can monitor their health data and receive evidence-based information and education about their conditions.

Participants' collected monitoring data is visible in real-time to the SMILE Nursing team through the ProACT platform's triage web application. In addition to this, vital inputs can be configured to trigger alerts when they are outside of expected thresholds. As an example, when an SpO2 reading below a given threshold is captured by the platform, this will generate

an alert for the attention of SMILE nursing personnel. Alerts are monitored daily by SMILE nurses through the ProACT platform's triage web application, and can provide an early indication that a patient's health may be deteriorating, allowing for timely intervention.

To support integration of care around SMILE participants, access to the platform has been extended to ICPCD specialist staff in the Chronic Disease hubs, giving visibility of ongoing health data from the patients they have referred to the SMILE service. In the case of a patient showing signs of deterioration, the SMILE Nurse, in collaboration with the chronic disease specialist team staff, will agree the appropriate steps to be taken. This allows for early intervention and prevention of further exacerbation of a patient's condition, as well as decreasing the likelihood of the patient requiring an unscheduled Emergency Department visit.

3. Methodology

3.1 Formative Evaluation

Formative evaluation was used to gather real-time feedback during the early stages of the project to ensure its successful implementation and optimisation before full implementation. This ensured that the virtual case management system was responsive to the needs of both patients with multi-morbid chronic conditions and healthcare providers.

Project learnings were captured systematically by the project manager on a learning log on a 3 month basis and shared with the project team at monthly meetings. The project team determined if adaptations were required to methodologies as a result of this feedback. The learnings were also shared with the clinical staff involved both in Caredoc and in the health services e.g. Ambulatory Care Hubs, Acute and GP practices for adoption during the project. The learnings informed the Project Interim Report in April 2024 and this Final Report and were also shared with senior management in the ECC, in the CHO, and in Caredoc.

Formative Evaluation Findings:

- **Identified Barriers**: such as patient enrolment not completed on target time. See the Implementation section for more detail on mitigation strategy.
- **Refined the Intervention**: Used the feedback to make necessary adjustments to the project by broadening the range of referrers and increasing stakeholder engagement.
- **Improved Patient Care Experience**: minor adjustments were made to the service based on feedback from the Patient Experience Survey. For example, the SMILE nurse subsequently has an increased emphasis on the use of community and HSE services. A support booklet 'Tips for Self-Managing your Health when living with a Long-term Health Condition' is now provided to participants on enrolment to the project.
- **Engaged with CD CST staff:** the project team met with 10 CD CST staff individually in December 2023/January 2024 to gain qualitative feedback on their experience of referring patients to the project. Some hub staff requested feedback on referrals from the SMILE team and this was provided.

- **Enhanced the Project Plan:** the project team developed a more comprehensive rollout strategy based on lessons learned. This included refining processes for care coordination such as the development of a care pathway for Heart Failure Urgent Referral to CD CST or CNS in Wexford General Hospital.

3.2 Structural Evaluation

Structural evaluation ensures that the foundational elements of the virtual case management system are in place, allowing for effective patient care, smooth operations, and long-term sustainability of the project. It evaluates whether the necessary infrastructure, resources and organisational systems are in place to support the project's implementation.

3.2.1 Project Governance

Project Steering Group
The project Steering Group was established in Q1 2023 and meet quarterly. The Terms of Reference identify that the group are responsible for the overall governance and implementation of the project. They ensure that the project is delivered in an integrated manner with the Community Specialist Teams and aligned to the National Model of Care for Chronic Disease.

Project Team
The Project Team was established in Q1 2023 and meet monthly. The Terms of Reference identify that they oversee the development and working of the project including corporate and clinical oversight.

Financial Management Overview
Financial management is under the governance of the Assistant National Director for the ECC. The HSE Project Manager links with Caredoc for monthly monitoring and financial reporting. Financial reports are submitted every six months for approval by Pobal. There was a project underspend in 2023 due to a HSE staff vacancy and low numbers of participants enrolled in the project in the first few months. The project budget was re-profiled in 2024 with extended funding approved by Pobal, to recruit an additional 300 patients to the project from April – December 2024.

Risk Management Overview
A risk management register is maintained by the Project Team and is reported on monthly to Pobal with mitigation steps outlined. One minor risk was reported for 2023 which was mitigated against and resolved by year end.

The evaluation result is that all of the above structural elements were put in place at the commencement of the project and are working well.

3.2.2 Project Resources

Project Staff
All project staff were recruited in 2023 including: HSE Clinical Lead and Project Manager; Caredoc Clinical Nurse Lead, Project Officer, Telephone Triage Nurses, Field Operators, and IT Administrator.

Project Documentation
A patient consent form (Appendix 1), patient information leaflet (Appendix 2) and the inclusion/exclusion criteria (Appendix 3) were developed for patient enrolment. These were provided to health and social care professionals (HSCPs) at the 60 project briefing meetings were held over the duration of the project.

Inclusion/exclusion criteria for patient enrolment
The clinical model of SMILE 1 was adapted for ECC integration, and enhanced inclusion criteria were agreed by the Project Team. The SMILE 2 criteria are based on those used in SMILE 1 but with narrower eligibility conditions to reflect the complexity of the patients requiring more intensive case management. The project is based on population health principles so that the programme will be suitable for national scale up if successful. The criteria are part of the project guidelines and are project output 1.7.

Project Guidelines
The 'Guidelines for SMILE 2 Project' were developed as a project milestone and are transferable to enable scalability. They support the project by clearly articulating the processes utilised by SMILE nurses in collaboration with their colleagues in the community setting (chronic disease hubs) to equip patients who have complex care needs to self-manage, by supporting them virtually through episodes of illness and engaging them to maintain their optimal health and wellbeing. See Appendix 9 for the Guidelines. Also available for users of HSeLanD at https://cnh.hseland.ie/icpcd/integrated-care-programme-for-chronic-disease/shared-learning/

The guidelines include:

- Processes and Best Practices for Caring for Patients with Multi-morbidity
- Guidelines on Responses to Patient Alerts
- Guidelines on Patient Virtual Engagement

3.2.3 Stakeholder Engagement and Knowledge Dissemination

The SMILE team engaged intensively with CD CST, GPs and hospital staff to share knowledge, problem solve and obtain feedback on the operational effectiveness of the project. The project team maintained regular contact with stakeholders to provide support throughout the project and to provide resources to facilitate referral to the project. This included emailing stakeholders monthly with 'project updates' that shared project progress including enrolment numbers.

In November 2023, the project team and the Slaintecare team in the Department of Health organised a Slaintecare webinar 'Innovation and Transformation in our Health Services to promote the project. This was a very successful webinar that included video interviews with SMILE patients and had 347 people in attendance.

The project team engaged with HSE press to provide patient stories and a staff profile for publication in national press media.

The project team presented a poster 'SMILE 2 – To Test the Integrated Virtual and Specialist Care of Multimorbid Chronic Disease Patients' at the International Conference on Integrated Care (ICIC24) in Belfast in April 2024.

The project team presented a poster 'SMILE 2 – To Test the Integrated Virtual and Specialist Care of Multimorbid Chronic Disease Patients' at the EEC Conference, Dublin - ***Integrated Healthcare: Advancing Health Service Reform*** in September 2024.

See Appendix 4 for detailed information on stakeholder engagement and communications.

3.3 Outcome Evaluation Data Collection Methods

Healthcare Utilisation Questionnaire: patients complete a healthcare utilisation questionnaire on enrolment that asks about their use of GP services, ED attendances and hospital admissions. The project records any unscheduled healthcare visits for participants that occur during their time participating on the project. Measurement of reduction of unscheduled care is carried out by analysis of the patient reported usage.

EQ-5D-5L health questionnaire: the questionnaire assesses five dimensions of health-related quality of life (HRQoL) – mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Patients complete the EQ-5D-5L health questionnaire at project enrolment and six months after. This provides data to measure better health and wellbeing.

ProACT platform: measurement of improvement in symptom stabilisation and engagement with virtual monitoring is measured by analysis of time trend data from the ProACT platform.

Patient Experience Survey: a Patient Experience Survey is administered by a Field Operator at six months, to ask people about their experience and views of the project. Seeking feedback from patients is important for the development and sustainability of the service and to improve the quality of the service. This feeds into the refinement of the service to reflect their needs and preferences.

3.4 Patient Population Description

Table 1: Patient Description

Active Participants as of 31 December 2024

F	211
M	266
Grand Total	**477**

Age Range	24 to 93
Mean Age	68

Average no. of conditions	**3**
Diabetes	*311*
COPD/Respiratory	*283*
HF	*201*
CAD	*208*
CVD	*68*
HTN	*432*
Arrhythmia	*134*

3.5 Ethical Considerations

On enrolment to the project, participants provide their informed consent to have their data processed as part of the project. They are informed that any personal information which they provide to the project will be treated strictly in accordance with the Data Protection Acts 2018 and the General Data Protection Regulations (GDPR). This includes consenting to information about them being stored or electronically processed for the purpose of health research and service improvement.

4. Implementation

4.1 Project Timeline

Figure 3: SMILE 2 Project Timeline

Migration of SMILE 1 cohort to new project

The SMILE 1 project has been mainstreamed and is operational for patients in CHO 5 Carlow/Kilkenny. The existing cohort of 122 patients from SMILE 1 was migrated to the integrated programme SMILE 2 in May 2023 so that they can benefit from integrating their care with the community specialist team staff. These patients continue to be monitored by the SMILE nurses but now require less frequent contact.

4.2 Enrolment of first 300 patients

Educational sessions: The Project Team met with health and social care professionals (HSCPs), on 60 occasions during the project life cycle, to provide educational sessions on the project. This included briefings with CST clinical teams from the four chronic disease hubs in the CHO, specialist chronic disease staff from the acute services including Heart Failure nurses and COPD Outreach staff, CHN staff, Registered Nurse Prescribers, GP educational sessions, as well as individual practice sessions with GPs and Practice Nurses to extend the reach of the project throughout primary care.

The educational sessions provided a detailed description of the service to help familiarise people with the project, the processes involved, the technology, the time required to refer a patient to the service, and the roles, responsibilities of each of them.

Resources were provided at these briefings including the patient consent form (Appendix 1), patient information leaflet (Appendix 2), inclusion/exclusion criteria (Appendix 3) and the presentation slides.

Also, a demonstration of the monitoring equipment and the IT platform was provided at these meetings. These sessions also provided an opportunity to discuss staff concerns and to encourage enrolment. Video links promoting the SMILE 1 project were provided to help with promoting the project to patients.

Recruitment of the first 150 SMILE 2 patients (first phase): commenced in May 2023 and was completed in December 2023. The project target to complete the enrolment was August 2023. Reasons for not meeting this target are outlined in the Challenges and Mitigations section.

Recruitment of the second 150 SMILE 2 patients phase (second phase): commenced in December 2023 and was completed in April 2024. The recruitment activities from the first phase of enrolment were continued and in some instances, repeated, for staff who were unable to attend the original sessions.

Interim Report April 2024
The interim evaluation report detailed the background to the project, project initiation, achievements, challenges and learning to date for the project alongside the projects benefits and scalability of the project. Preliminary data collected from patients that had been enrolled for over 6 months in the project indicated very positive interim results. These interim results were shared with stakeholders including Pobal and the Department of Health.

4.3 Enrolment of an additional 300 patients

The project target to expand the service to the additional 300 patients was met by April 2024, within the original approved budget. This presented the financial challenge of being able to continue recruiting patients to the virtual case management service for the remainder of 2024. The project secured extended funding to recruit an additional 300 patients to the project from April – December 2024, bringing the total number of patient enrolments to 600. Please see Challenge 2 in the Challenges and Mitigations section for more detail on this.

Supporting the Data Analytics Demonstrator Pilot: At the request of the Department of Health, the HSE is currently piloting an AI Predictive Model (The Data Analytics Demonstrator Pilot) to identify and support patients who frequently attend ED/are admitted to hospital. The model is now being deployed in Carlow/Kilkenny as a pilot area, referral of high risk patients commenced in December 2024, into an existing ECC Clinical Pathway. The SMILE service is a major intervention pathway for the chronic disease patients identified. The overall objective is to reduce the frequency of unscheduled attendance at St Luke's Hospital.

4.4 Challenges to date and mitigation strategies

Challenge 1: First 150 patient enrolments not completed on time by end of August 2023

Mitigation strategies: The project team activated the risk mitigation register to respond to the risk 'failure to recruit sufficient patients'.

Action: In addition to continuing to engage with CD CST staff, this strategy involved engaging with GPs, Practice Nurses, acute staff and other suitable professional staff in Community Health Networks (CHNs) in CHO 5 to promote and to invite referrals to the project. In total there are approximately 400 potential referrers and the team met them several times in person, to repeat the message about SMILE and at times convenient to them.

A total of 50 engagement meetings/presentations were held between May 2023 and February 2024. These included meetings with CD/CST staff, Network GP Leads, attendance at GP CME meetings, sessions with Practice Nurses, Clinical Consultants in all 4 hospitals, acute staff working in respiratory, cardiology and endocrinology services, outreach clinics, primary care staff and Community Health Networks management teams, throughout the region.

The project team aimed to encourage discussion and communicate and share a clear vision of the project to ensure that everyone could understand its added value for patients. The meetings allowed clinical staff to clearly understand the appropriate complex patient to refer and the referral, consenting and feedback processes.

Outcome: The first 150 patient enrolments were completed by December 2023.

Challenge 2: The second challenge was to continue recruiting patients to the virtual case management service, after April, when the 300 patients budgeted for in the original application was reached.

This was important as it allowed hub clinicians, GP and hospital consultants to continue to refer to the service from April 2024 and consolidate their referral practice.

Also, by continuing the service for 2024, the project team were able to understand what the "normal" referral rate to a virtual case management service was, from a population the size of CHO 5 when it settled into a "routine" level. This helped with designing a sustainable service that can be scaled to other geographic areas. It also meant that the extensive educational and supporting effort to describe the project and encourage referrals from the region's clinicians in the earlier stage of the project was maximised.

An extension to the budget was required to be able to continue recruiting patients as additional hours and travel were required for nursing staff, field operators and IT administration. Additional infrastructure needed to be purchased including IT licenses, hosting costing, outbound call costs, and monitoring kits for patients.

Mitigation strategies: Apply for extended funding to Pobal and the Department of Health to cover the cost of enrolling an additional 300 patients over the remaining time of the project (April – December 2024).

Action: The project team submitted a proposal in March 2024, to continue recruiting patients to the virtual case management service, after April, when the 300 patients budgeted for in the original application was reached.

Outcome: The change request to the budget was approved by the Department of Health and Pobal in May 2024. The project continued recruiting patients to the virtual case management service, after April, and enrolled 477 patients by end of December 2024. It is expected that approximately 150 additional patients will be assigned to the SMILE project intervention from the pilot programme of the data analytics project which went operational in the Carlow/Kilkenny area in December 2024. These patients are being consented for referral to SMILE and those who consent will be assigned in January/February 2025 as appropriate to the SMILE programme, bringing the total patient complement to approximately 600 patients.

This enlarged cohort of patients enabled the project to define and design a sustainable model for the service which is an additional project outcome to those proposed in the original project application.

5. Outcome Evaluation Results

The project has met its four outcomes and output targets in relation to healthcare utilisation, engagement with technology, symptom stabilisation and better health and wellbeing (Appendix 5). The Patient Experience Survey also demonstrated high levels of patient satisfaction with the project. Full results are outlined below.

5.1 Outcome 1

Target - 20% of all participants report a reduction in unscheduled care episodes. Including GP day time, ED attendances and unscheduled care hospital admissions.

This outcome is based on the cohort of patients who are at least 6 months in the project, 267 participants had 6 months' of enrolment data up to 31st October 2024.

Of the cohort included in this analysis, 41.9% were female, 58.1% were male and the average age was 67 (ranging from 25 to 94).

At enrolment SMILE 2 participants were asked to complete a recall-based questionnaire about their unscheduled healthcare utilisation in 2019, i.e. how many unscheduled GP appointments, Emergency Department visits and nights they spent in hospital as a result of unplanned admissions. This established the baseline data for Outcome 1.

During the setup phase of the project, in April 2023, the triage software was programmed with a specific question set to enable collection of ongoing data from enrolled participants

during outbound calls in order to measure their usage of unscheduled care during their participation in SMILE 2 versus reported usage in 2019. SMILE nurses routinely asked patients at each telephone contact if they had attended their GP or Emergency Department, if they had consequently been admitted and for how many nights, since their last call with a SMILE nurse.

Table 2: Percentage of patients with unscheduled urgent GP visits

% OF PATIENTS WITH UNSCHEDULED URGENT GP VISITS	
Reduced Visits	86.5%
Same Visits	8.6%
Increased Visits	4.9%
Net Reduction	81.6%

The above table 2 and figure 4 below show data for the cohort of patients who had been at least 6 months in the project. The results are very consistent with results presented in the Interim Report. There was a net reduction of 81.6% of patients who attended their GP since their enrolment in the SMILE programme.

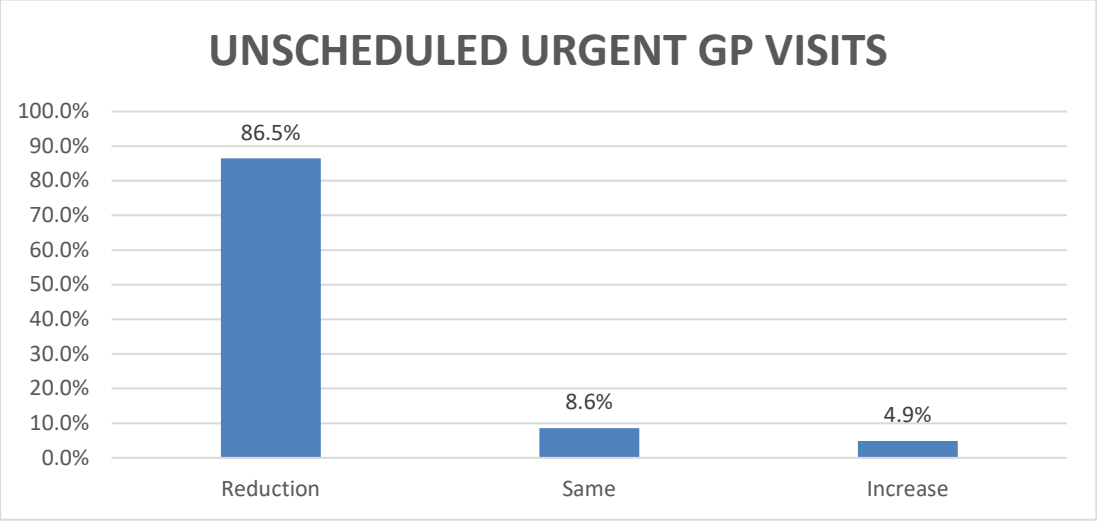


Figure. 4: Percentage of patients with unscheduled urgent GP visits

Table 3: Percentage of patients with unscheduled ED attendance

% OF PATIENTS WITH UNSCHEDULED ED ATTENDANCE	
Reduced Visits	41.2%
Same Visits	45.7%
Increased Visits	13.1%
Net Reduction	28.1%

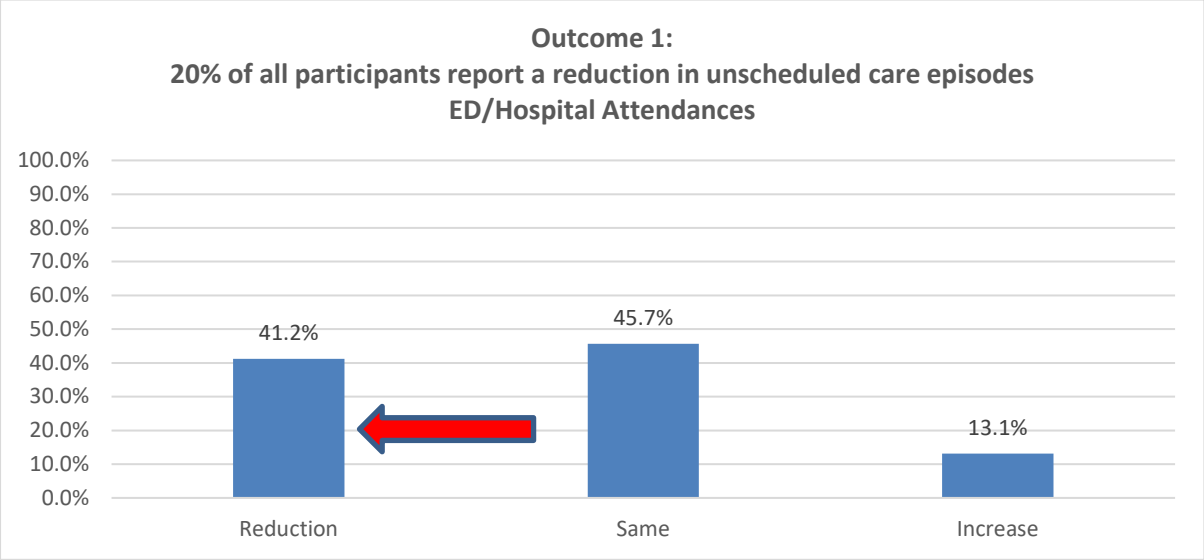


Figure 5: Percentage of patients with unscheduled ED attendance

Patients enrolled in the Programme had a net reduction of 28% in those who attended ED, this was consistent with the Interim Report and shows a significant reduction in ED attendance for patients in the programme, exceeding the predicted outcome of 20% as shown in table 3 and figure 5 above.

Table 4: Percentage of patients with unscheduled hospital bed nights

% OF PATIENTS WITH UNSCHEDULED HOSPITAL BED NIGHTS	
Reduction in bed nights	43.8%
Same number of bed nights	48.7%
Increased number of bed nights	7.5%
Net Reduction in patients bed nights	36.3%

There was a significant reduction in bed nights used in patients who were admitted to hospital that had been enrolled in the programme. Reduction in hospital bed nights used by patients who had been enrolled in the programme compared to their pre enrolment experience was 36.3% reduction in bed nights used which exceeds the planned target of 20% as shown in table 4 above and figure 6 below.

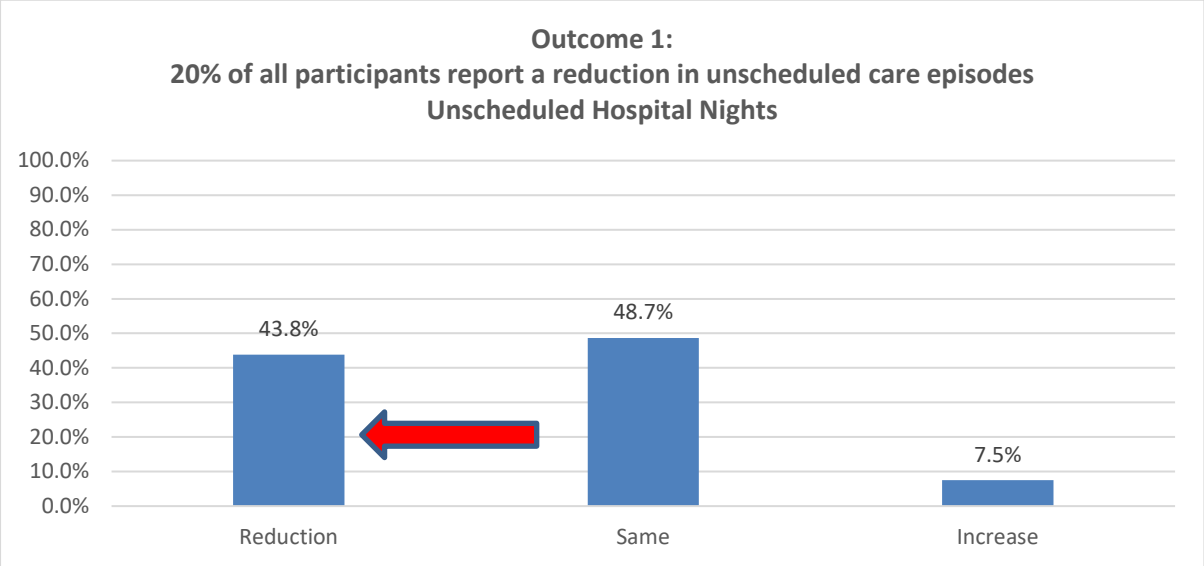


Figure 6: Percentage of patients with unscheduled hospital bed nights

In addition to outcome 1 which shows the percentage reduction in patients who had received health services pre and post project enrolment, the following table 5 demonstrates the total number of attendances for GP and ED visits and the total number of bed nights used by this cohort of 267 patients in the analysis in six months of the baseline year of 2019 compared to six months after their enrolment in the SMILE programme.

Table 5: Total number of attendances for GP and ED visits number of bed nights used

Visits	Baseline 6/12 2019	6 months post SMILE enrolment	% reduction
Total number GP Visits	807	153	81%
Total number ED visits	206	91	55%
Total number of hospital bed nights used	687	173	75%

In the six month period a reduction of 75% occurred in the bed nights used, a 55% reduction in ED visits and 81% reduction in GP attendances for these patients. Patients attribute this to them being better able to identify deterioration of their condition early and self-manage it, with the help of their SMILE nurse, aided by their better understanding of their condition and the confidence that they have gained.

5.2 Outcome 2

Target - 50% of patients enrolled will engage with the technology monthly

This information was retrieved from the triage software to measure the presence of vital sign data on at least one occasion in a given month for active participants. The monthly breakdown up to October 2024 is detailed below in tables 6 and 7 and shows 77% to 100% monthly engagement by patients, exceeding the 50% target.

Table 6: Patient engagement with the technology monthly in 2023

	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Newly enrolled patients per month	17	4	23	18	23	39	47
Total number of Participants per month	17	21	44	62	85	124	171
Number of participants who accessed patient app in month	**16**	**19**	**44**	**60**	**76**	**111**	**152**
(% of output 1.1)	**94%**	**90%**	**100%**	**97%**	**89%**	**90%**	**89%**

Table 7: Patient engagement with the technology monthly in 2024

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Total number of participants per month	209	253	278	307	320	340	367	391	417	441
Number of participants who accessed patient app	**183**	**211**	**221**	**235**	**256**	**284**	**302**	**304**	**337**	**353**
(%)	**88%**	**83%**	**79%**	**77%**	**80%**	**84%**	**82%**	**78%**	**81%**	**80%**

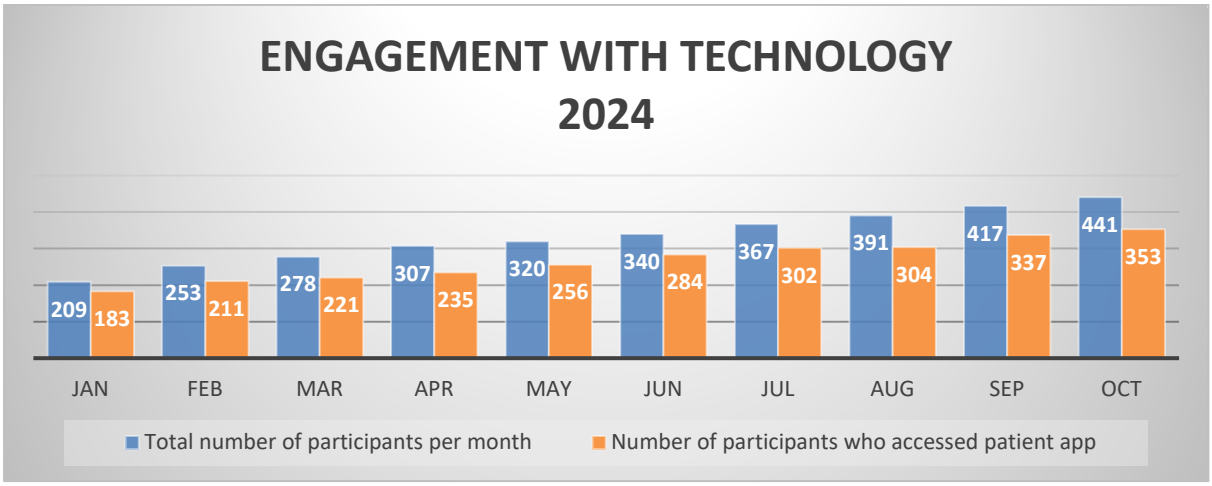


Figure 7: Patient *engagement with the technology monthly in* 2024

5.3 Outcome 3

Target - 30% of newly enrolled patients will experience symptom stabilisation

This outcome is based on the patients who had at least 6 months enrolment in the programme, 267 participants had 6 months' enrolment data up to 31st October 2024.

Participants in the SMILE 2 programme are equipped with a variety of connected devices to monitor their vital signs (e.g. blood pressure, heart rate, oxygen saturation levels). Within the ProACT platform that they are provided access to, vital inputs can be configured to trigger alerts when they are outside of expected thresholds. As an example, when an SpO2 reading below a given threshold is captured by the platform, this will generate an alert for the attention of the SMILE nursing team, who monitor alerts daily through the ProACT platform's triage web application.

Symptom stabilisation was measured by observing a reduction in system-generated alerts for each participant during the course of their 6 months of enrolment.

Table 8: Percentage of symptom stabilisation in a 6 Month Period

Symptom Stabilisation - 6 Month Period	
Stabilised	72.3%
Not Stabilised	27.7%

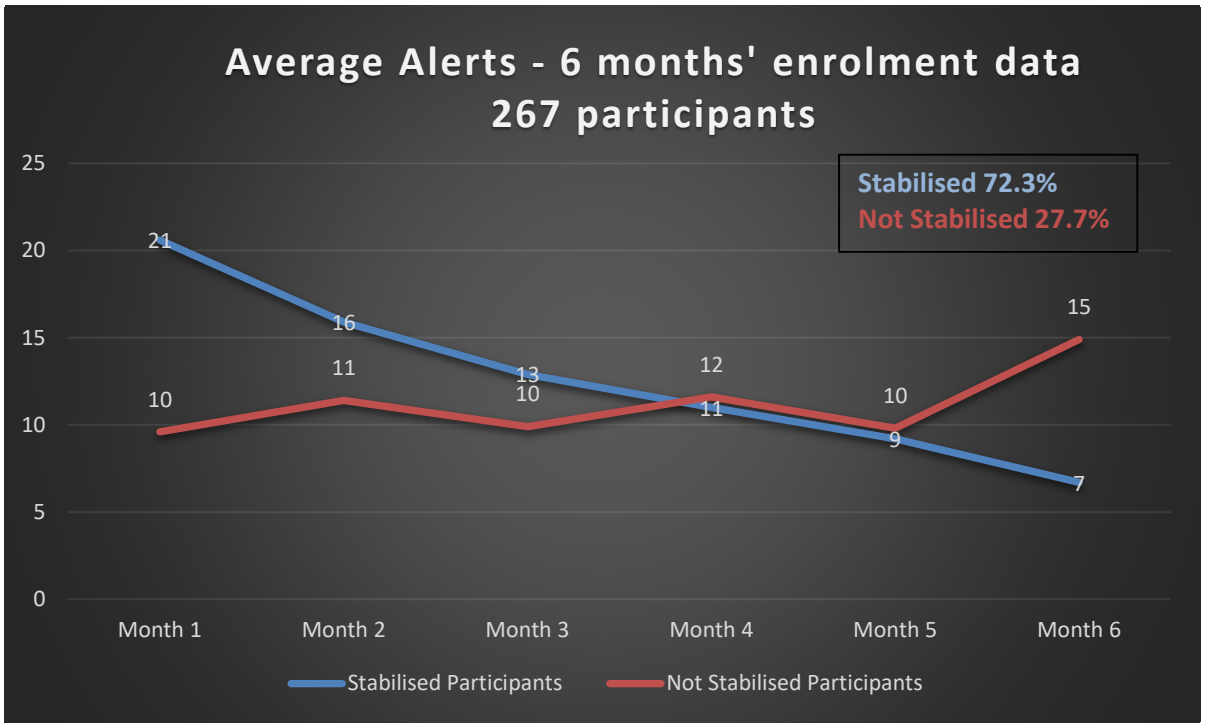


Figure 8: Average number of alerts during 6 months enrolment

The above table and graph show that 72% of patients stabilised their symptoms and had reduced alerts over the 6 months of their participation in the project. As can be seen from the graph the reduction in alerts over the 6 months was almost linear, with the greatest stabilisation occurring within the first 3 months. However there are a subset of patients who do not stabilise over the 6 months period and require ongoing support.

This stabilisation of symptoms of 72% considerably exceeds the target of 30% set at the beginning of the project. Clinically it is these patients, who stabilise their condition with the support of the project, who then experience less periods of deterioration, as they are capable of self-managing their condition at an earlier stage before deterioration. This leads to reduced GP unscheduled care, reduced ED attendance and hence reduced bed nights in hospital.

5.4 Outcome 4

Target - 50% of patients self-report better health & well-being as a result of enrolment

This outcome is based on the patients who had at least 6 months in the project, 250 participants had 6 months' of enrolment data up to 31st October 2024 and had completed quality of life questionnaires.

The EQ-5D-5L questionnaire measures self-reported health-related quality of life, as participants are asked to select their functioning level across five dimensions (mobility, self-care, usual activities, pain and discomfort and anxiety and depression) on a 5-point scale, with higher scores indicating greater problems. The EQ-5D-5L also includes a Visual Analogue Scale (VAS), asking participants to self-rate their health with the endpoints – 0="the worst health you can imagine" and 100="the best health you can imagine". It is recognised as a universal method of patient reported outcome data collection in that it enables the measurement of health-related quality of life of a diverse range of patients, diseases and treatment areas.[12]

The EuroQol EQ-5D-5L questionnaire was completed by 250 participants at 2 time points – at enrolment and after 6 months' participation in the programme. This cohort also completed a Patient Experience Survey at the second timepoint that was devised by the SMILE 2 Project Team.

There were 17 participants who were eligible to complete both questionnaires declined to participate or were unreachable by the SMILE team, equating to a 93.6% response rate which exceeds the 90% target.

A comparison of VAS at baseline and post-6 months' enrolment shows that 59.2% indicated a better health status at the second timepoint, with 17.6% describing no change and 23.2% perceiving a reduction in how well they felt as shown in table 9.

Table 9:
Comparison of Visual Analogue Scale (VAS) readings at baseline and post-6 months

Increased reported VAS	59.2%
Same reported VAS	17.6%
Decreased reported VAS	23.2%

An analysis of VAS response averages from enrolment (T1) and 6 months' post enrolment (T2) also indicates an increase in participants' self-rated health as shown in table 10.

Table 10: Comparison of Visual Analogue Scale (VAS) average readings at enrolment and 6 months' post enrolment

T1 – Average VAS	**T2 – Average VAS**
65.83	72.86

Table 11 below describes the average values for each of the Health Related Quality of Life dimensions at baseline and post 6 months' enrolment.

Table 11: Average values for each Health Related Quality of Life dimension at baseline and post 6 months' enrolment.

Quality of Life dimensions	**Baseline Average** ***(Standard Deviation)***	**Post 6 months' enrolment Average** ***(Standard Deviation)***
1.Mobility	1.84*(1.05)*	1.78*(1.04)*
2.Self-care	1.33*(0.75)*	1.24*(0.64)*
3.Usual activities	1.84*(1.19)*	1.72*(1.04)*
4.Pain and Discomfort	1.85*(1.08)*	1.70*(1.02)*
5.Anxiety and Depression	1.37*(0.76)*	1.31*(0.76)*

As can be seen in this table, the Health Related Quality of Life indicators remained stable between baseline and post 6 months' enrolment, with improvements in all 5 dimensions observable across the entire cohort.

5.5 Patient Experience Questionnaire

Feedback from participants was also collected after a period of 6 months enrolment, to gather views on the service and provide those enrolled with the means to communicate their experience of participation anonymously. A Patient Experience Questionnaire was devised by the SMILE 2 Project Team that consisted of 21 questions, with 18 of these entailing a statement followed by a 5 point Likert Scale to measure polarity, (i.e. Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree). These statements centred on asking participants to rate their experiences with the digital support kit, their experiences with the SMILE nursing team, if they feel that their understanding of their health issues has improved since joining SMILE, and if their health had improved.

Question 1.15 asks participants if they feel the SMILE programme has helped to improve their health and wellbeing as shown in table 12 below.

Table 12: Participants' responses to question 1.15

	Strongly Agree	%	Agree	%	Neutral	%	Disagree	%	Strongly Disagree	%
1.15 The SMILE Programme has helped to improve my health and wellbeing.	142	*56.8 %*	92	*36.8 %*	13	*5.2%*	3	*1.2%*	0	*0.0%*

The full analysis of responses on their associated scales is outlined in table 13 below.

The 18 questions in table 13 explore a number of facets of the patient's experience: they explore the experience of the patients of being enrolled in the programme, setting up the equipment and being given information. It also explores the patient's confidence and understanding of managing their condition as well as their improved lifestyle habits and their overall health and wellbeing. Data from the questionnaire confirms that patients are more aware when they are experiencing deterioration in their illness (80.4%) and 64.4% agree that since joining SMILE they have had less visits to the ED. To the questions concerning set up, support and improved health and wellbeing 80% - 90% of patients agreed positively. Over 50% of patients agreed that the SMILE programme had helped them be aware and use other HSE services, overall 98.4% of patients agreed that their experience in the SMILE service had been positive as shown in Fig. 9 below.

Table 13: Patients' responses to questions 1, 1.1- 1.16 and 2.1

Question with Likert Scale Answer	Strongly Agree	%	Agree	%	Neutral	%	Disagree	%	Strongly Disagree	%
1. In my first call with the SMILE nurse I felt the service was explained well to me.	193	*77.2%*	48	*19.2%*	3	*1.2%*	5	*2.0%*	1	*0.4%*
1.1 I was happy with the setting up of my monitoring equipment.	196	*78.4%*	43	*17.2%*	4	*1.6%*	6	*2.4%*	1	*0.4%*
1.2 I feel supported to use the digital support kit.	190	*76.0%*	54	*21.6%*	4	*1.6%*	2	*0.8%*	0	*0.0%*
1.3 I find the digital support kit easy to use.	172	*68.8%*	59	*23.6%*	12	*4.8%*	7	*2.8%*	0	*0.0%*
1.4 I feel the SMILE nurse understands my health issues.	201	*80.4%*	44	*17.6%*	3	*1.2%*	1	*0.4%*	1	*0.4%*
1.5 I feel that the SMILE nurse listens to me.	210	*84.0%*	33	*13.2%*	5	*2.0%*	0	*0.0%*	2	*0.8%*
1.6 The information the SMILE nurse gives me is easy to understand.	195	*78.0%*	51	*20.4%*	2	*0.8%*	2	*0.8%*	0	*0.0%*
1.7 When the SMILE nurse calls me back about an alert I feel she helps me resolve the issue or refers me appropriately.	184	*73.6%*	51	*20.4%*	14	*5.6%*	1	*0.4%*	0	*0.0%*
1.8 Since joining SMILE I feel that my confidence in managing my illness has improved.	154	*61.6%*	78	*31.2%*	11	*4.4%*	7	*2.8%*	0	*0.0%*
1.9 Since joining SMILE, I feel that I understand my illness better.	151	*60.4%*	76	*30.4%*	16	*6.4%*	7	*2.8%*	0	*0.0%*

Table 13: Patients' responses to questions 1, 1.1- 1.16 and 2.1

Question with Likert Scale Answer	Strongly Agree	%	Agree	%	Neutral	%	Disagree	%	Strongly Disagree	%
1.10 Since joining SMILE, I have had less visits to the hospital Emergency Department.	99	*39.6%*	61	*24.4%*	62	*24.8%*	26	*10.4%*	2	*0.8%*
1.11 Since joining SMILE, I am more aware of when flare-ups are starting.	116	*46.4%*	85	*34.0%*	35	*14.0%*	14	*5.6%*	0	*0.0%*
1.12 Since joining SMILE, I feel the SMILE nurse helps to motivate me to improve my everyday habits e.g. walk more, eat more healthily etc.	110	*44.0%*	91	*36.4%*	21	*8.4%*	28	*11.2%*	0	*0.0%*
1.13 Since joining SMILE, I feel that I can talk to the SMILE nurse if I have any worries.	179	*71.6%*	62	*24.8%*	6	*2.4%*	3	*1.2%*	0	*0.0%*
1.14 The SMILE nurse discusses other useful services in the community with me.	74	*29.6%*	56	*22.4%*	48	*19.2%*	71	*28.4%*	1	*0.4%*
1.15 The SMILE Programme has helped to improve my health and wellbeing.	142	*56.8%*	92	*36.8%*	13	*5.2%*	3	*1.2%*	0	*0.0%*
1.16 The SMILE Programme has helped me use other HSE services more effectively e.g. community specialist nurse, physiotherapist or ED service.	74	*29.6%*	59	*23.6%*	66	*26.4%*	50	*20.0%*	1	*0.4%*
2.1 My experience of the SMILE service overall has been positive.	196	*78.4%*	50	*20.0%*	3	*1.2%*	1	*0.4%*	0	*0.0%*

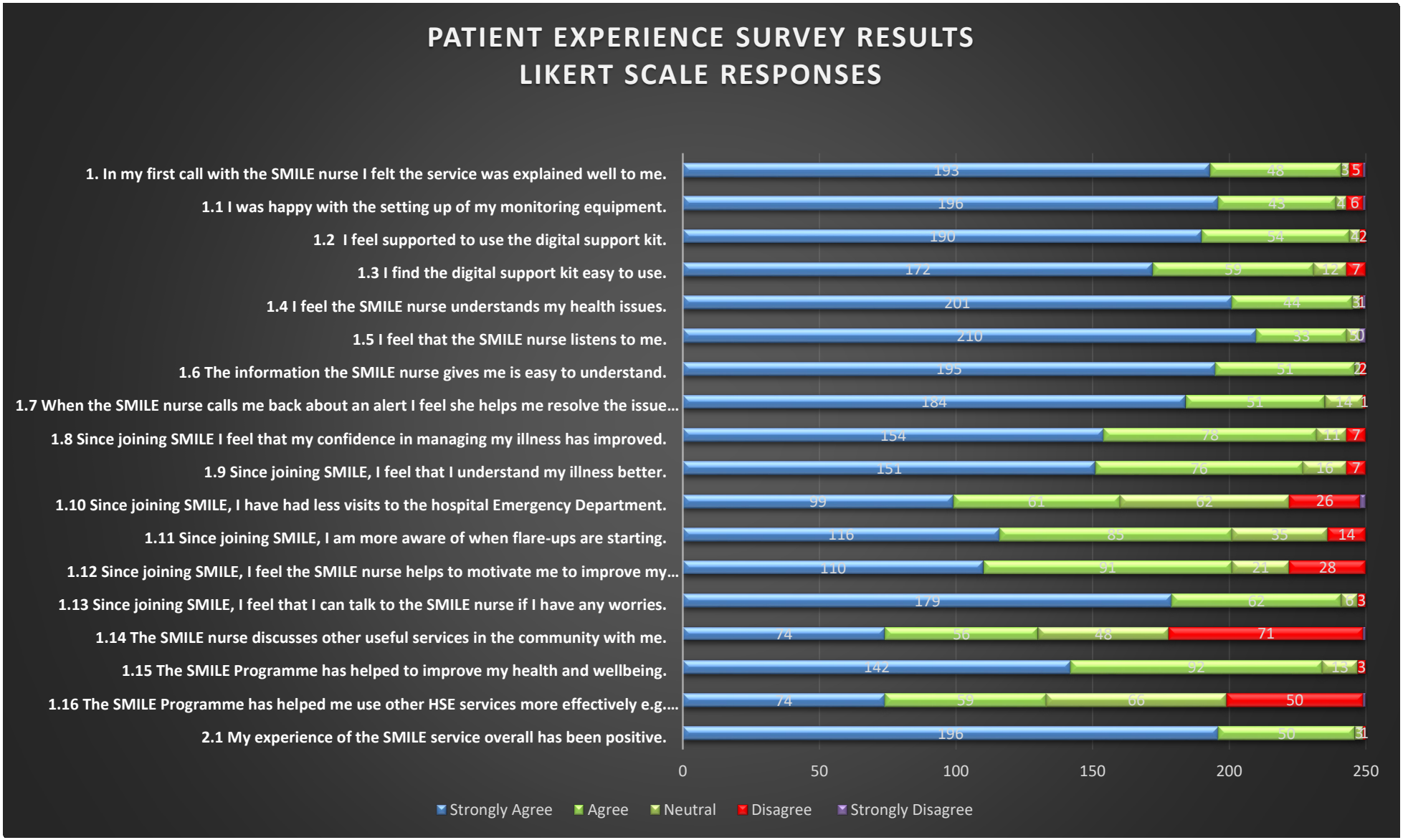
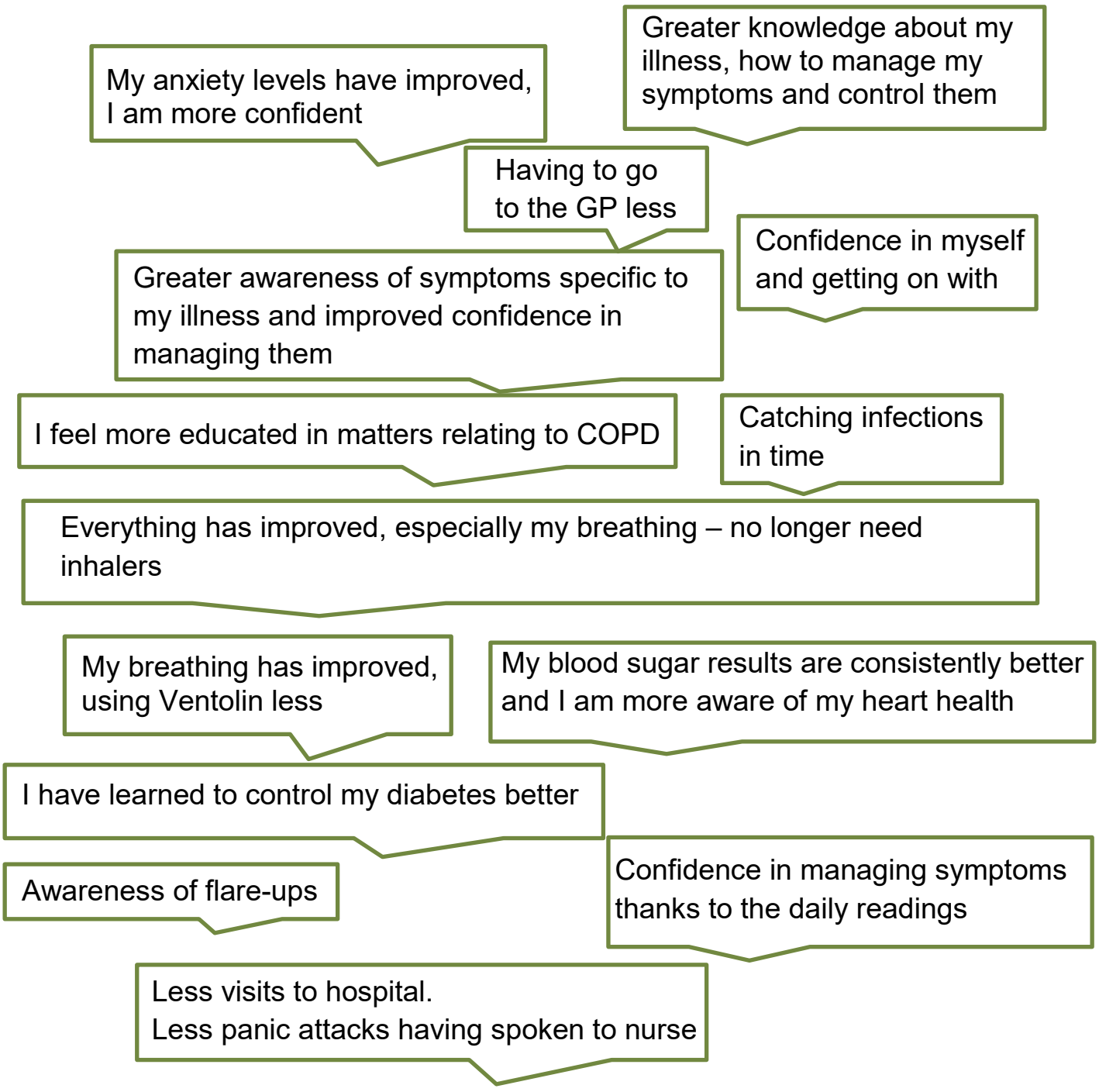


Figure 9: Patients' responses to Likert questions showing range of agreed/disagreed responses

Questions 19-21 invited free text responses to capture any personalised insights that participants wished to offer, i.e. “what one thing has improved for them since joining the SMILE service”, “how could the SMILE service be improved?” and “if there was anything further they would like to say”. Appendix 7 gives the full responses.

Question 19 asked patients to;
“Tell us one thing that has improved for you since you joined the SMILE service”.

The main themes that emerged from question 19 were reassurance, confidence, health awareness and general health improvement as indicated by the responses below.



In answer to question 20: "Please tell us how we can improve the SMILE service".

181 of the 250 responses did not have suggestions for improvements (Nothing (90); No (20); Not complete (71)). Of the remaining 69 participants' responses, the majority reported being happy with the service (15). The main improvements suggested were in relation to making the service available over the weekend (9); being able to call back the nurse directly (4); and improving the battery life of the tablet (5).

In answer to question 21: "Is there anything else you would like to say"

159 of the 250 responses did not have anything else to say (No (86); Not complete (73). Of the remaining 91 participants' responses, the majority reported being very happy with the service (30) and provided very positive feedback about the SMILE nurses (19).

6. Discussion

6.1 Key Insights

Implications of the findings
The project has achieved its target outcomes and outputs along with testing the proof of concept of the project. It has achieved its five objectives:

- Empower patients to self-care, and improve health.
- Shift care to the community and reduce unscheduled care.
- Integrate services with ECC.
- Develop processes, guidelines and inclusion criteria that are transferable and scalable, and would enable national scale up.
- Reduce frequent unscheduled visits and late presentations to ED, AMAU, and GP.

The clinical results achieved both for the reduction in alerts and subsequent saving in ED/Hospital admissions and bed nights demonstrates an effective case management service that produces health service savings that make the case management service affordable and sustainable, e.g. current results indicate that 75% of hospital bed nights and 55% of ED visits would be saved from the cohort of patients annually.

Scalability
Virtual case management is more cost effective than traditional models as it reduces the need for in-person visits, reduces time wasted on missed appointments, and virtual delivery allows for larger nursing caseloads across a range of chronic diseases. It improves access for patients by reducing the need to attend healthcare facilities, saving on time, travel and cost and increased access for those living significant distances.

Only virtually provided case management is sufficiently efficient to scale nationally. SMILE 2 provides a blueprint for a national case management service that completes the ICP CD Model of Care. Nationally transferable materials and guidelines have been developed as part of this project, that will enable regional and national scale up.

Using Triage nurses is more cost effective than using CNS staff to provide case management. The Triage nurses integrate well with specialist staff and the service integrates well with the Chronic Disease Hub services.

Patient Benefits

Virtual case management reduces the need for in-person visits, improves accessibility, and reduces time wasted on travel and cost. The SMILE nurses and referrers received very positive feedback from patients about the project and being able to access the service within their home environment. Some patients are bringing their SMILE tablet to their HSE healthcare appointments and it enables them to be more involved in their care.

A secondary benefit of the SMILE participant having access to the SMILE tablet is that they may use it to access other virtual programmes and training including pulmonary rehabilitation and cardiac rehabilitation virtual classes.

SMILE patients can use their smart watches for counting steps during cardiac rehab.

Patients feel empowered to self-care and improve their health as described in the Patient Experience Survey. For example, SMILE participants are more educated/motivated when attending rehab classes and are therefore more able to benefit from the classes.

Service Integration Benefits

The SMILE project supports clinician workflows and enhances delivery of services to ECC's patient cohort. HSE staff and GPs consistently reported the positive benefits of the project and how it complements the work they are doing. The positive relationships with referrers that have been created through engagement, results in increased referrals to the project and the programme is more integrated as part of the CD CST.

CD CST staff have access to the Caredoc ProACT platform and report huge benefits of being able to remotely see their patients' data daily. Timely, accurate patient information supports informed decision making and effective changes to patient management plans. The co-ordination of patient information amongst the health professionals ensures a patient-centred approach. For example, cardiac rehab services benefit from the SMILE project by getting access to live patient monitoring results from SMILE equipment during their rehab session.

CNSs report benefits from being able to use the ProACT platform to provide remote cardiac rehab to patients who cannot attend, using SMILE videos and clinical monitoring available through the ProACT system. Also access to the platform, removes the need for CNSs to set up episodic 24 hour ambulatory blood pressure monitoring for patients. Using the SMILE data, Clinical Nurse Specialist (CNS) prescribers are enabled to titrate medications as required.

Clinical data is not available to HSE staff via HSE platforms currently and is only available through the SMILE project. Good integration is dependent on clinical data being available.

Utilising the SMILE technology enhances the delivery of integrated services to meet the health needs of the population.

Each ECC CD CSTs are at different levels of evolution. In cases where a speciality is not operating to full capacity the full CD CST level of service may not be offered. This may result in the CD CST staff not yet seeing the cohort of patients (high needs) suitable for the project. However, the opposite is also true, where full staffing is not in place referral to the SMILE programme can provide support to patients who require additional monitoring even in the absence of the CD CST staff and support hospital avoidance for patients.

Significant engagement between CD CST staff and the SMILE team has resulted in the development of care pathways. An example of this is the Care Pathway for Heart Failure Urgent Referral to CD CST or CNS Wexford General Hospital. This is described in more detail in the SMILE Guidelines.

The functionality to refer to SMILE via Healthlink has been established and enables GPs to refer more easily to the project.

Signposting and Discharge Pathway

The SMILE project integrated with HSE and GP services over the duration of the project life cycle and is well liked by patients and professionals, who have fed back the benefits they perceive to the project team. The formative evaluation and engagement with the clinical teams and with patients identified that it would be useful to sign post patients more explicitly to HSE and other voluntary support services creating a pathway for patients on discharge. The discharge pathway will be developed as part of the programme outputs for 2025. Materials and information for sign posting patients will also be developed in 2025 as part of the programme outputs, to further integrate the end to end pathway for patients. The clinical IT connectivity of the ProACT system has been made available to the Hub clinical staff to great effect. Functionality to refer to SMILE via Healthlink has been established which will enable GPs to refer more easily to the project.

Change Management

A significant stakeholder engagement process and ongoing communication strategy with key stakeholders for the project resulted in CD CST, GPs etc. becoming familiar with the project and buying in to the sustainability of the programme.

Ongoing engagement with individual clinicians has supported creating readiness to change ways of working to embrace the SMILE programme, commitment to the project resulting in increased referrals to the SMILE programme.

Enablers

A strong local ECC governance structure supports services to function well and can influence change and culture thus supporting referrals to the project.

Referrals are more numerous in areas where there are staff that are early adopters and there are local champions of the project which has in turn supported other areas to engage in the project.

Benefits are maximised in teams where the Integrated Care Consultant has been appointed, all staff are recruited and the service is well established.

Good IT support and home installation of the digital support kit, has been a key success factor in patient engagement in this programme.

Barriers

Lack of access to Wi-Fi for some patients is seen as a barrier particularly for people from lower income groups, older people and marginalised groups e.g. travellers or people from Roma community, 20 of the 602 patients referred to the project did not access the project due to lack of Wi-Fi. It is not known how many patients were not referred to the project because of lack of access to Wi-Fi. A recommendation in relation to making access to Wi-Fi available is made in the conclusion section.

6.2 Sustainability

It was important to identify the appropriate number of referrals to a high needs service such as SMILE, for a given geographic population, as this allowed a sustainable model to be designed. By enrolling 600 patients to the virtual case management service, over a two year period, the project established the “routine” clinical referral rate from a population the size of CHO 5 (500,000). This information allowed the project to design a sustainable model that can be scaled to other geographic areas.

Sustainable Model

The “sustainable model” involves patients receiving a more intensive engagement with the triage nurse for the first 3 months of the service, following their referral, in order to stabilise their condition and educate them on self-management.

They receive a lower level of engagement between four and six months and a reduced “safety net” level of engagement from 6 months to 1 year. Most patients will be discharged after 1 year from 2025 onwards.

This reducing level of engagement is in keeping with the clinical stabilisation results demonstrated. Particular patients who do not stabilise, often patients with heart failure, require tailored approaches. Approximately 28% of patients are slower to stabilise.

In addition, there is an attrition rate of approximately 2%, from the programme due to patients withdrawing from the service, being admitted to a nursing home or dying.

Hence, the project model is sustainable, if a balance is maintained between the referral rate and discharges and the intensity of engagement with inflows of referrals, planned discharges and discharges through death, withdrawal or nursing home admittance.

The project's objective to define an ongoing sustainable service that is scalable, was to identify and establish the equilibrium between referral to the service at a "normal clinical rate", reducing service intensity, together with attrition and discharge to define what is required to provide a sustainable service for a population of 500,000. This also allowed the calculation of scale up costs to a larger population e.g. regional or national for the sustainable model.

- In 2024 the programme demonstrated that the clinical referral rate from the population of 500,000 settled to approximately 23 to 25 appropriate patients per month.
- 300 of the existing participants will have been in the project for over a year in 2025, and it is planned that these appropriate patients would be discharged during 2025.
- This will allow an additional 300 patients to be enrolled at the rate of 25 per month.
- Approximately 28% of the cohort are high needs patients and are slow to stabilise.
- The nurses are each assigned equitable numbers of patients in the high need category, the 0 to 3 month from enrolment category, the 3 to 6 month category and the 6 to 12 month category.
- The nurses each manage their caseload within their time capacity providing more intensive support to patients in the early stages of enrolment and tapering off as their symptoms stabilise.
- The service capacity of 600 patients was sufficient to meet the steady clinical referral rate of 25 patients per month which was found to be the average clinical referral rate of appropriate patients from a population of 500,000.

The above model enables scale up resourcing from a population of 500,000 to be calculated for the clinical referral rate of appropriate patients.

7. Conclusion

The project achieved its four outcomes and output targets;

- Healthcare utilisation,
- Engagement with technology,
- Symptom stabilisation and
- Improved Health and Wellbeing.

The Patient Experience Survey also demonstrated high levels of patient satisfaction with the project. The impact of the service on patient care is evidenced by the reduced unscheduled healthcare visits and the empowerment of patients to self-care and improve their health.

The results on healthcare utilisation demonstrated that both the proportion of patients attending ED and GP and being admitted reduced following their enrolment in the programme,

and also the absolute number of ED, GP visits and hospital bed night usage, reduced considerably following 6 months in the programme.

Patients engaged regularly with their technology as described in the Outcome Results section.

Three quarters of patients' symptoms stabilised quickly following enrolment. Approximately 28% of patients did not achieve this rapid symptom stabilisation. These were often very sick patients and often suffered from heart failure. This is not surprising as patients in the unstable stages of heart failure i.e. towards the terminal phases of the condition, have frequent decompensation events.

More patients reported better health and wellbeing having been enrolled in the project for over six months and showed improvements on the standard EQ–5D–5L quality of life scale. In addition, almost 94% of patients agreed that the SMILE programme had helped to improve their health and wellbeing; over 80% of patients confirmed that they were more aware when they were experiencing a deterioration in their illness, demonstrating that patient education and the ability of monitoring symptoms supports the empowerment of patients.

Virtual case management and remote monitoring collectively enhance the effectiveness of healthcare delivery, improve patient outcomes, and contribute to a more sustainable and accessible healthcare system. By minimizing emergency visits, hospital admissions, and in-person consultations, remote monitoring and virtual case management can lead to significant cost savings for both healthcare systems and patients. Virtual case management can be scaled to reach larger populations, making it an effective solution for health systems aiming to manage widespread chronic disease care efficiently. It also improves access for patients by reducing the need to attend healthcare facilities, saving on time, travel and cost and increased access for those living significant distances.

SMILE 2 provides a blueprint for a national case management service that completes the ICP CD Model of Care. Nationally transferable materials and guidelines have been developed as part of this project, that will enable regional and national scale up.

In addition to the original outcomes, the project has developed a sustainable model of expected referrals from clinicians, tapering intensity of service and discharge, together with the resources required for a population of 500,000. This model can be scaled either regionally or nationally to various population sizes.

The project recommends that if the project is scaled up in the future that access to Wi-Fi will be explored for individuals who cannot afford Wi-Fi. This will help to reduce health inequalities and increase equity in service provision for individuals from low income or marginalised groups.

This report recommends that the project receive mainstream funding from 2026 onwards, to continue project delivery in the South East and be expanded to support the Data Analytics Demonstrator Pilot ongoing.

Reference List

1. Brady TJ, Murphy L, O'Colmain BJ, Beauchesne D, Daniels B, Greenberg M, et al. A Meta-Analysis of Health Status, Health Behaviors, and Health Care Utilization Outcomes of the Chronic Disease Self-Management Program. Prev Chronic Dis [Internet]. 2013 Jan 17 [cited 2019 Jan 31]; 10. Available from: http://www.cdc.gov/pcd/issues/2013/12_0112.htm

2. Wennberg DE, Marr A, Lang L, O'Malley S, Bennett G. A Randomized Trial of a Telephone Care-Management Strategy. N Engl J Med. 2010 Sep 23; 363(13):1245–55.

3. Härter M, Dirmaier J, Dwinger S, Kriston L, Herbarth L, Siegmund-Schultze E, et al. Effectiveness of Telephone-Based Health Coaching for Patients with Chronic Conditions: A Randomised Controlled Trial. Fukumoto Y, editor. PLOS ONE. 2016 Sep 15; 11(9):e0161269.

4. Kivelä K, Elo S, Kyngäs H, Kääriäinen M. The effects of health coaching on adult patients with chronic diseases: A systematic review. Patient Educ Couns. 2014 Nov; 97(2):147–57.

5. Coulter A, Entwistle VA, Eccles A, Ryan S, Shepperd S, Perera R. Personalised care planning for adults with chronic or long- term health conditions (Review) [Internet]. The Cochrane Collaboration.; 2015. Available from: http://aura.abdn.ac.uk/bitstream/handle/2164/5609/CD010523.pdf?sequence=1

6. Panagioti M, Reeves D, Meacock R, Parkinson B, Lovell K, Hann M, et al. Is telephone health coaching a useful population health strategy for supporting older people with multimorbidity? An evaluation of reach, effectiveness and cost-effectiveness using a 'trial within a cohort.' BMC Med. 2018 May 30; 16(1):80.

7. Hutchison AJ, Breckon JD. A review of telephone coaching services for people with long-term conditions. J Telemed Telecare. 2011 Dec; 17(8):451–8.

8. McLean S, Protti D, Sheikh A. Telehealthcare for long term conditions. BMJ. 2011 Feb 3; 342 (feb03 2):d120–d120.

9. Olsen JM, Nesbitt BJ. Health Coaching to Improve Healthy Lifestyle Behaviors: An Integrative Review. Am J Health Promot. 2010 Sep; 25(1):e1–12.

10. Dennis SM, Harris M, Lloyd J, Powell Davies G, Faruqi N, Zwar N. Do people with existing chronic conditions benefit from telephone coaching? A rapid review. Aust Health Rev. 2013; 37(3):381.

11. Developing population health management in Ireland – Challenges and Opportunities , Hayes C, O Reilly O, European Journal of Public Health, 2023, October 2024, supplement 2.

12. Devlin N, Parkin D, Janssen B. Methods for Analysing and Reporting EQ-5D Data [Internet]. Cham (CH): Springer; 2020. Chapter 1, An Introduction to EQ-5D Instruments and Their Applications. 2020 Jul 21.

Appendices

Appendix 1: Patient consent form (pg1/2)

Caredoc
St Dympna's Hospital, Athy Road, Carlow
Tel: (059) 9138199 (Office Hours Only)
Email: smile@caredoc.ie

Patient Consent Form to be contacted by a SMILE nurse

Supporting Multimorbidity selfcare through integration, learning and eHealth

Are you over 18 years of age? Yes ☐ No ☐

Do you have 2 or more of the following conditions (please tick those that apply):

Diabetes	
Coronary Obstructive Pulmonary Disorder (COPD)/Chronic Bronchitis/Emphysema/Asthma	
Heart Failure	
Coronary Artery Disease	
Cerebrovascular Disease	
Hypertension	
Arrhythmia	

Please provide the following information:

Name	
Date of Birth	
Telephone Number	
Mobile Number	
Address	
GP Name	

Please complete this form and return it to your Clinical Specialist. A Caredoc nurse will be in contact with you by telephone.
Signed: _____ Date: _____
FOR CLINICAL SPECIALIST TO COMPLETE:

Referrer: _____

ICPCD Team Location & Discipline: _____

Please specify main reason for referral: _____

To your knowledge how many unscheduled visits did this patient have for their chronic condition in the last year?
ED ☐ *Admission* ☐ *GP Out-of-Hours* ☐

If patient is absent please indicate here that verbal consent has been obtained ☐

Appendix 1: Patient consent form (pg2/2)

1. Introduction
We fully respect your right to privacy and to protection of your personal data. Any personal information which you provide to us will be treated strictly in accordance with the Data Protection Acts 2018 and the General Data Protection Regulations (GDPR). We are committed to being transparent about how we collect and use that data and to meeting our data protection obligations.

2. Scope
This policy refers to all applications and data contained therein received in respect of the SMILE Project.

3. How do we collect your information?
We collect personal data from you from the application form you complete. This includes: Name, date of birth, telephone number, mobile number, address, GP name and any current medical conditions.

4. How do we use your information?
We will only use personal data provided for the purpose of determining whether the candidate will be a suitable participant of the SMILE service

5. Legal basis for processing
Caredoc's lawful basis for processing personal data of applicants is the performance of a contract and for the provision of healthcare.

6. Who do we share your information with?
Your information may be shared internally for the purposes of determining the suitability of the candidate for the SMILE service.

7. Retention of Data
Caredoc is under legal obligation to keep certain data for a specified period of time. If you are deemed not appropriate for the SMILE service, we will destroy your personal data one month after receipt.

If you are deemed appropriate for the SMILE service, the periods for which your data will be held will be provided to you in the SMILE Participants Privacy Notice.

8. Security and Storage of Data
Caredoc will take all reasonable steps to ensure that appropriate security measures are in place to protect the confidentiality of both electronic and manual data. Security measures will be reviewed from time to time, having regard to the technology available and the cost and the risk of unauthorised access. Caredoc Employees are required to implement all organisational security policies and procedures, e.g., use of computer passwords, locking filing cabinets.

9. Your Rights
Under the General Data Protection Regulation (GDPR) you have a number of rights with regard to your personal data: Right of Access, Right to Rectification, Right to Erasure, Right to Restriction, Right to Data Portability, Right to Object

If you would like to exercise any of these rights, please contact the Caredoc Data Protection Officer, Tricia Cosgrave; tricia.cosgrave@caredoc.ie

10. Right to Lodge a Complaint
You have the right to lodge a complaint to the Data Protection Commission if you believe that we have not complied with the requirements of the GDPR with regard to your personal data.

Appendix 2: Patient information leaflet

You are being invited to take part in a service called SMILE which provides telephone nursing support and technology to help to support people living with chronic health conditions to improve their overall health and wellbeing.

Participants will:

receive telephone calls from a Caredoc nurse
use health monitoring devices in their home

Who can take part?

People aged over 18 years of age, who have 2 or more of the following conditions:

- Type 1 and Type 2 Diabetes
- COPD/Chronic Bronchitis/Emphysema/Asthma
- Heart Failure
- Coronary Artery Disease
- Cerebrovascular Disease
- Hypertension
- Arrhythmia

What will happen if I decide to take part?

Complete the patient consent form to be contacted by a SMILE nurse. The nurse will then contact you to explain the project to you in detail.

Where can I get more information?

If you would like more information you can phone the Caredoc SMILE team on 059 9138199, Monday to Friday during office hours.

Appendix 3: Inclusion/exclusion criteria

Inclusion Criteria

To be eligible for enrolment, patients must:

- Be over 18 years of age.
- Be living with multimorbidity, i.e. 2 or more of the following chronic conditions:
    - Diabetes Type 1 and Type 2
    - COPD/Chronic Bronchitis/Emphysema/Asthma
    - Heart Failure
    - Coronary Artery Disease
    - Cerebrovascular Disease
    - Hypertension
    - Arrhythmia
- Have multimorbidity and require **intensive case management** and ongoing professional support.
- Be able to provide written informed consent prior to enrolment.
- Be able to understand and agree to comply with healthcare advice.
- Be available for scheduled calls from the SMILE 2 team.
- Be able to regularly engage with the provided technology.
- Have access to wireless internet for optimal use of patient digital support kit.
- Have access to telephone/mobile service for receiving calls from the SMILE 2 team.
- Be able to use a device to measure his/her own physiological parameters or have somebody to assist with this.
- Agree to the collection of their data for remote monitoring as well as overall aggregation and analysis for collation of project metrics.

Exclusion Criteria

A patient will not be eligible for enrolment if they:

- Are able to self-manage with ordinary levels of support from GP, Practice Nurse or CNS.
- Are under 18 years of age.
- Are not living with multi-morbidity (i.e. lives with less than 2 chronic conditions).
- Do not have access to wireless internet.
- Do not have access to a telephone/mobile service for receiving calls from the SMILE 2 team.
- Are unable to provide written informed consent prior to enrolment.
- Are unable to understand and agree to comply with healthcare advice.
- Are unavailable for scheduled calls from the SMILE 2 team.
- Are unable to regularly engage with the provided technology.
- Are unable to use a device to measure his/her own physiological parameters or have access to assistance with this.
- Are not in agreement with the collection of their data for remote monitoring as well as overall aggregation and analysis for collation of project metrics.

Referrers will be required to exercise professional judgement in selecting only patients with very high need requirements for this project.

Appendix 4: Stakeholder Engagement and Communications

May 2023- Oct 2024	60 educational sessions with the Project Team and health and social care professionals (HSCPs). This included briefings with: CST clinical teams from the four chronic disease hubs in the CHO, specialist chronic disease staff from the acute services including Heart Failure nurses and COPD Outreach staff, CHN staff, Registered Nurse Prescribers, GP CME meetings and individual practice sessions with GPs and Practice Nurses
02/11/2023	Sláintecare Webinar Series Right Care, Right Place, Right Time Innovation and Transformation in our Health Services
14/02/2024	Wexford hub - Cardiology Service Open Day
04/03/2024	South East Regional Healthy Ageing Seminar
11/04/2024	'Digital Health, Redefining the South East' Dr. Orlaith O'Reilly presented on SMILE
21-23 April 2024	International Conference on Integrated Care (ICIC24), Belfast exhibited SMILE poster
04/06/2024	HSE Press Release 'Telehealth service keeping patients healthier and at home for longer'
07/06/2024	South East Radio interview: Dr. Orlaith O'Reilly & Tony Reck, a SMILE patient (from Wexford) on the Morning Mix show with Alan Corcoran
14/06/2024	**Irish Examiner** SMILE nurse, Barbara O' Gorman featured in the article 'Working Life: It's a privilege to support patients with chronic disease'
June 2024	HSeLanD ECC hub HSE Integrated Care Programme for the Prevention and Management of Chronic Disease Newsletter Issue 4 June 2024
16/07/2024	SECH Integrated Enhanced Community Care 'Sharing The Learning' event in University Hospital Waterford Dr. Orlaith O'Reilly presented on SMILE
September 2024	'Health Matters' Autumn 2024 edition - HSE staff magazine SMILE featured in Telehealth article on page 49.
05/09/2024	EEC Conference, Dublin - ***Integrated Healthcare: Advancing Health Service Reform*** exhibited SMILE poster
11/09/2024	Practice Nurses Study Day, Kilkenny – Mary Burke, Clinical Manager, Caredoc presented on SMILE and SMILE nurses hosted an information stand
15-17 October 2024	North American Conference on Integrated Care, Canada (NACIC) - Dr. Maria O'Brien presented on SMILE

Appendix 5: Project Outcomes and Outputs

No. 1	Outcome Name
Outcome 1	**20% of all participants report a reduction in unscheduled care episodes. Including *GP day time, ED attendances and unscheduled care hospital admissions.*** *(The number of patients, Output 1.1, that report fewer episodes 6 months after registration compared to 6 months in 2019. Data may be made available at end of project)*
Output 1.1	Number of total patients per month
Output 1.2	Count of patients exiting prematurely each month (attrition)
Output 1.3	Number of patients completing questionnaire at enrolment (% of output 1.1)
Output 1.4	System for recording any unscheduled healthcare visits in place
Output 1.5	Data analysed to calculate reduction in GP daytime services usage
Output 1.6	Data analysed to calculate reduction in ED attendances and unscheduled care hospital admissions
Output 1.7	The development of inclusion and exclusion criteria for patient suitability for virtual case management, for use in further national scale up.
Output 1.8	Development of guidelines for virtual case management for; • Processes and best practice for caring for patients with multimorbidity • Guidelines on responses to patients alerts • Guidelines on patient virtual engagement.
No. 2	**Outcome Name**
Outcome 2	**50% of patients enrolled will engage with the technology monthly** (% of output 1.1)
Output 2.1	Analysis of engagement data
Output 2.2	% of engagements with virtual monitoring of clinical symptoms by patients. (% of output 1.1)
No. 3	**Outcome Name**
Outcome 3	**30% of newly enrolled patients will experience symptom stabilisation** (% of output 1.1)
Output 3.1	Trend analysis in symptom stabilisation
No. 4	**Outcome Name**
Outcome 4	**50% of patients self-report better health & wellbeing as result of enrolment** (% of output 4.2)
Output 4.2	Number of patient survey at project closure (% of output 1.1)
Output 4.3	Analysis of patient surveys & questionnaires

Appendix 6: Patient Experience Survey

What is the aim of this questionnaire?

We would like to hear about your experience with the SMILE service.

To do this we need to understand what it feels like to use the SMILE service, as well as what parts you liked or disliked so that we can continually improve this service. We appreciate your time in sharing your experiences with us.

Will my information be confidential?

The information you share will be handled and stored in line with Data Protection Legislation.

Your anonymous feedback will be used to help us make delivering these services better for all. We would like to use some of your feedback for presentations, research and reports but you will not be identified.

Your responses are anonymous so please do not include your name or the names of anyone involved in this service.

By completing this questionnaire, you are consenting to your experience being shared, anonymously.

Thank you for participating in the survey.

Please rate to what extent you agree or disagree with the following statements. There are no right or wrong answers. If you are not sure, simply answer with the choice that most closely matches your opinion.

1. In my first call with the SMILE nurse I felt the service was explained well to me.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.1 I was happy with the setting up of my monitoring equipment.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.2 I feel supported to use the digital support kit.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.3 I find the digital support kit easy to use.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.4 I feel the SMILE nurse understands my health issues.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.5 I feel that the SMILE nurse listens to me.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.6 The information the SMILE nurse gives me is easy to understand.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.7 When the SMILE nurse calls me back about an alert I feel she helps me resolve the issue or refers me appropriately.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.8 Since joining SMILE I feel that my confidence in managing my illness has improved.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.9 Since joining SMILE, I feel that I understand my illness better.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.10 Since joining SMILE, I have had less visits to the hospital Emergency Department.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.11 Since joining SMILE, I am more aware of when flare-ups are starting.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.12 Since joining SMILE, I feel the SMILE nurse helps to motivate me to improve my everyday habits e.g. walk more, eat more healthily etc.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.13 Since joining SMILE, I feel that I can talk to the SMILE nurse if I have any worries.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.14 The SMILE nurse discusses other useful services in the community with me.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.15 The SMILE Programme has helped to improve my health and wellbeing.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

1.16 The SMILE Programme has helped me use other HSE services more effectively e.g. community specialist nurse, physiotherapist or ED service.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

2. Tell us one thing that has improved for you since you joined the SMILE service.

2.1 My experience of the SMILE service overall has been positive.

☐ **Strongly Disagree** ☐ **Disagree** ☐ **Neutral** ☐ **Agree** ☐ **Strongly Agree**

2.2 Please tell us how we can improve the SMILE service.

2.3 Is there anything else you would like to say?

Thank you for taking the time to complete this questionnaire.

Appendix 7: Patient Experience Results to questions 19, 20 and 21

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
All my illnesses have been checked daily and gives me and my wife peace of mind	The service is excellent. Very good. Can not be better.	No, all has been covered
More attentive of my health	Not complete	I'd like to compliment the whole SMILE team and I strongly recommend the service
My anxiety levels have improved, I am more confident	Nothing	I don't know where I'd be today without the service. I have gained in the experience 110%, the SMILE project is my comfort blanket and the SMILE nurses are angels. May God bless them all
Awareness of my weight and blood pressure	No	Not complete
Feeling supported which in turn reduces health related anxiety	Nothing	All staff members are brilliant!
Positive experience using technology has kept me more informed	Nothing	I am very grateful and you have a great team!
Only became aware of having low blood pressure by joining SMILE	Not complete	Lovely to speak to someone that understands your problems
Greater knowledge about my illness, how to manage my symptoms and control them	Nothing	Please add the facility of adding daily step count manually for people who do not use the Withings watch
General health has improved	Improve technical issues with bp monitor for patients with pacemakers	No
Being on the programme motivates me to do more	Nothing	Step count according to the watch is not always accurate
Reassuring that all readings are monitored	Nothing	No
Reassurance that daily readings are being monitored	Nothing	Tablet not holding charge for as long as it used to. Has to be charged every 2nd day.
Taking advice better now, more confident getting out of home	Nothing	No
Very beneficial	Nothing	No
Not complete	Not complete	Not complete
My overall health has improved as a result of SMILE	I'd like for GPs to be a lot less sceptical of the service.	The SMILE nurses saved my life twice. Can't thank them enough.
Exercising more	Nothing	No
Breathing and mobility	Nothing	Overall slightly improved general health
My confidence regarding my health	Nothing	I love all of the SMILE nurses, they are all uplifting and inspirational
I feel happy knowing that someone has my back and am reassured by the triage nurses	Would be helpful if SMILE could influence the continuation of health & exercise programmes within the community	No

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
My breathing has improved, using Ventolin less	An option to report an issue/tech issue on the tablet itself instead of having to phone the office	No
A feeling of safety and reassurance	Nothing	No
My blood pressure is very stable	Not complete	Thank you all
Overall reassurance	Nothing	No
My mobility and confidence	Nothing	No
My awareness of my health issues	The ability to report any issues on the tablet	No
I'm more conscious of checking my levels and also watching my diet	Not complete	I have found the SMILE nurses have been hugely supportive and quick to respond to any issues that arose
I'm very happy with the reassurance provided by the service	Nothing	No
My confidence	Should be able to call back, calls come from private number	I would like to say that all staff are great
I feel reassured by the monitoring service	Nothing	No
My health	Not complete	Not complete
My overall level of health awareness has improved	The watch could be more streamlined and attractive	No
I am regularly monitoring my diabetes, getting more exercise and more aware of my health.	Happy with everything	Thank you all for your assistance
My diabetes is more under control	Nothing	No
My blood sugar results are consistently better and I am more aware of my heart health	Nothing	I am happy with the monitoring service overall
I have taken huge comfort from being monitored. The project and especially the nurses are great.	I have nothing to say	Not complete
Not complete	Not complete	Not complete
It feels like someone is looking after me	Nothing	I'd be lost without it
I am more aware of my condition and more diligent	Be able to contact nurses directly	Very positive influence on my life
Physically I feel a whole lot better since starting the programme	Not complete	The nurses are to be complimented, they are super
Overall my health has improved	Nothing	No
Overall outlook on health has improved	Nothing	Excellent service, very reassuring
Awareness of health and benefits of diet and exercise	Nothing	The SMILE service is very beneficial to the community
I have lost weight and improved my diet	Facility to input past BSL readings	No
Awareness of my blood sugars	Not complete	Thanks to the nurses for their prompt response when my sugar levels drop
Regular BP readings has made me more aware of my health	Tablet needs to be charged nearly every second day	No
Not complete	Not complete	Not complete
Awareness about my health is a lot better	I hope that I would be kept on the project fulltime as it is a huge benefit to me	I want to compliment the nurses on the great work that they are doing for me

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
Confidence	Nothing	No
I am happy to feel more motivated by the nurses	Nothing	No
I have become more consistent over time in taking blood pressure	Nurses could do with taking more time to enquire how patients are and to listen to the answers.	Please listen to patients
I am reassured that my blood pressure is continuously monitored	Nothing	No
Reassurance!	Nothing	No
Reassurance	To have the SMILE service available over the weekend	No
Less visits to hospital. Less panic attacks having spoke to nurse.	I think a direct number to the SMILE team would be helpful	I would like to thank all those involved in SMILE as it has made my life a lot easier
I have learned to control my diabetes better	If the technology was easier to use	Not complete
Motivation and peace of mind	Nothing	I am extremely happy to be part of this service and very grateful to everyone involved.
Peace of mind	Not complete	Not complete
Monitoring has improved my response to BP issues	Not complete	Not complete
My fitness and more aware of my blood pressure	Not complete	Not complete
Confident to know there's help if needed	Already great	Nurses all friendly and helpful
Keeping daily records helps me feel more confident	Not complete	Not complete
Has me very aware of keeping fit and weight management	Nothing	Hope it stays going
More conscious of my health	Nothing	No
General wellbeing improvement	Tablet logging out regularly	Not complete
My glucose levels have improved	Nothing	No
Less worry and more aware of my illness	Very happy with the service	No
My health	Nothing really. Very pleased.	No
Checking on my heart rate and oxygen levels.	Different blood pressure unit	I'm grateful for this service
My general health has improved	Nothing	Excellent service
Peace of mind	Nothing	Tablet needs to be charged every second day
Regular monitoring is very reassuring	Elastic strap on the watch	Brilliant service overall, very supportive nurses, they are all angels
I understand my illness better	Nothing	Not complete
Overall health has improved	What we have really cannot be improved much	Not complete
Helps me to keep track of my blood sugar levels	Not complete	Not complete
I can talk to the nurses about my health	Not complete	Not complete
Not complete	Not complete	Not complete

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
My health	The service should be rolled out nationwide	It's a brilliant service
Reassurance	Nothing	The swift phone calls if there is an alert are brilliant
Support and reassurance from nursing staff	Introduce A Fib monitoring please	No
I like to be kept accountable	The service has been excellent	Not complete
Not complete	Not complete	Not complete
My health has improved overall	It would be nice to meet the nurses face to face	Not complete
I feel more aware of my health issues	Nothing	No
Increased knowledge and awareness of symptoms and how to manage illness	It would be great if the service was also provided at weekends	We have never met people in healthcare as supportive and kind as the SMILE nurses
I am more motivated to exercise	Nothing	No
A feeling of being in control of my health	Provide tablets with a longer battery life	I am very happy with the service
My general health has improved	Not complete	Not complete
Eating habits	Weekend cover would be helpful	Not complete
I am more aware of my symptoms	More influence with GPs and consultants	Not complete
Assurance that there is someone to approach when feeling ill	The ability to record on the tablet how you are feeling, not just set questions	Very happy with the project
I am more reassured about my health and feel more confident	Nothing	Not complete
Better maintenance of my taking my medication	I am very happy	No, very happy with the service and it should be for everyone that needs it
More confidence in managing health issues	Recommend suitable classes or courses relative to my medical condition, especially chair-based exercise classes	No
Not complete	Not complete	Not complete
Recognising symptoms getting worse	Nothing, very happy with the speed of responses to alerts	Deployment of equipment needs to be slower-paced
Greater awareness of symptoms specific to my illness and improved confidence in managing them	Nothing, the tablet has everything on it	No
Reassurance	Advertise the service more within communities please!	Nothing
Not complete	Not complete	Good support. Phone calls are good.
Feeling more confident that there's someone looking after me	All the nurses are so kind and keep me at ease	The nurses do a great job. Must say if and when I pass over it won't be their fault.
Mobility and exercise regime have improved. Better energy overall.	Promote physiotherapy courses on behalf of patients	I am very happy with the service and couldn't ask for nicer staff
More aware of diet	Not complete	Not complete
More aware of diet	Not complete	Not complete
I understand my illness better	Not complete	The nurses are easy to talk to

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
Sugar levels. Sleeping better.	Refresher on technology use. Maybe a visit within a few weeks of initial set up.	Not complete
Everything is ok	Not complete	Not complete
Awareness of my illness issues	Nothing else occurs	Not complete
Feeling of reassurance	Better tablet battery life if possible please	No
My awareness of my blood pressure on a more regular basis and an awareness of my sleeping pattern	I'm happy with the service, can't think of any improvements needed at the moment	I feel more "protected" knowing I'll get a call if readings are above normal
Blood pressure	Not complete	The tablet battery has a short life
More aware of health	Not complete	Not complete
Having health professionals to talk to and the reassurance that comes from knowing readings are constantly monitored	Introduce weekend monitoring service please!	The nurses are angels and the service is a wonderful safety net for patients
The security of having a background of support if I need it	Not complete	Not complete
I keep a better check on my blood pressure	Not complete	No
I am reassured knowing the service is monitoring constantly behind the scenes	Discontinue the calls coming in from "Unknown" numbers please	No
Peace of mind that nurses are checking vital signs	Not complete	No
I have a sense of ease knowing my health is being monitored	Not complete	I am extremely happy to be part of this service and hope it continues
More aware of heart issues	Nothing	No
Happy with the improvement in my overall health	Continue the service long term	Not complete
I am very happy with the service and feel comfortable being monitored daily	Not complete	Not complete
I feel more educated in matters relating to COPD	Nothing	It would be helpful if my data could be accessed by GP surgery remotely
Confidence in managing my illnesses	No	No
Awareness of symptoms and being incentivised by the nurses	Temperature monitoring would be extremely helpful	No
My health awareness	I am so grateful to all of the nurses	Not complete
Not complete	Not complete	Not complete
Confidence in managing my illness	Please consider providing monitoring service at weekends	No
My blood pressure doesn't always register on the tablet after I've taken it	Back up service could be a bit better	Not complete
I am more aware of my health issues	Not complete	I am very happy with the service
Confidence in managing symptoms thanks to the daily readings	Nothing	Not complete

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
I am trying to exercise more since starting on the project	Not complete	I want to thank the nurses for their professionalism
My general wellbeing	Nothing	No
I am more aware of what normal blood pressure should be	I am very happy with the service	No
I am more motivated to exercise	Not complete	Very happy with the service
Motivated me more to improve health	Tablet takes a while to charge	Not complete
Confidence in interpreting readings	No, everyone in SMILE is a gem!	No
Peace of mind that daily readings are constantly monitored	Nothing	No
Confidence, learning that the support is there	Not complete	Excellent service
Being able to monitor my blood glucose and blood pressure is incredible	Not complete	Not complete
Not complete	Not complete	Not complete
My health	Not complete	Not complete
More conscious of and interested in my general health	Nothing	Tablet battery is draining very quickly
Confidence and reassurance	Nothing	No
Less visits to GP	Not complete	Great programme for us, to keep us mindful of X's readings and keep a check on everything
Awareness of my illness	Less phone calls	Not complete
Very happy to have daily access to BP readings and sleep data - very reassuring to have these monitored also	No	No
Everything has improved! The reassurance is amazing and the triage nurses are on the ball!	No, very happy with the service	Not complete
Not complete	Not complete	Not complete
Not complete	Not complete	Not complete
Not complete	Not complete	It helped me get my blood pressure under control
Receiving regular phone calls from the nurses is very reassuring	Nothing	Happy with the service
Confidence in managing my illness and symptoms myself	Nothing	No. Very happy with the service. Thanks to everyone.
I am more comfortable with information explained to me when SMILE nurse calls after an alert	I am very happy with the service	Just to thank the SMILE programme for looking after my wellbeing. Thanks
Confidence in myself and getting on with things	Not complete	Not complete
Mobility and frequency of exercise	Nothing, very happy with the service, nurses are very nice	No
Confident that reassurance is around the corner	Not complete	Not complete

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
Consistent now with exercise and more aware of blood pressure readings	No, everyone is absolutely marvellous, you are all angels	No
I walk more	Not complete	Not complete
Confidence in my health	No complaints	Very happy overall
Blood pressure and blood sugar levels have improved. More conscious of food intake and good health.	Nothing	Initial triage calls were a little too frequent
Weight loss. Exercise	Not complete	Great service
Actually taking accountability for my own health and being more conscious of how I'm actually feeling daily	I personally think I have got benefit from this experience and find it no problem checking my stats each morning	Just to say I think this is a very good service and would benefit lots more people
Blood pressure is now regulated where it had always previously been high	No suggestions	Very happy with the service, the nurses are lovely
I am more disciplined and regular taking meds and exercising. More health aware.	Have not thought about that, I am happy	No thanks
Knowing that "Big Brother" is out there	No.	Battery life short on tablet.
Confidence in my health. Walking more to build up the steps.	Not complete	Not complete
Mental care - feel better. More aware.	Nothing	Not complete
New medications since joining which have really helped	Not complete	Not complete
Keeping track of blood glucose levels	Not complete	Not complete
Understand illness and motivated to exercise more	Not complete	Very positive
More confident in managing my illnesses	No	Very happy with the service, everyone is very helpful
My blood sugar and the way I became aware of the importance of regularly monitoring every day	Not complete	Thank you for keeping in touch everytime my blood pressure and blood sugar gets high
Understanding my illness better	Not complete	Not complete
Not complete	Not complete	Not complete
Not complete	Not complete	Not complete
I am no longer worried about my blood pressure	No	Tablet battery is draining very quickly
Happy with nurse advice when call back is required after an alert	Nothing	No
Reassurance from nurses' calls and am now in the habit of taking regular readings	No	No
Awareness of blood sugars/blood pressure	Better functioning watch - digital ideally. Not really improving service as its excellent, but improves patient awareness	Thanks to all the staff!
Far more confident that my long term BP issue is now being monitored and controlled	Nothing	No
Confidence and reassurance that someone is in the background	No	No

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
My anxiety has considerably improved knowing the readings are monitored.	Have the triage service available at weekends please	No
More conscious of diet and stress levels	Allow patients to contact SMILE hub through a text service	No
Reassurance that readings are being monitored regularly	No	Not complete
Breathing has improved. More consistent taking proactive measures to address blood sugar and blood pressure issues.	Nothing	BP cuff gets very tight
More reassured about my health. Delighted to be on the project.	Happy with all aspects of the project	Not complete
Very aware of blood sugar levels now, compared to previously	Nothing	Not complete
Very happy that I now know what by blood pressure is. Being able to take and understand it explains occasional light-headedness etc	Nothing	No
Knowing that there is someone available to contact if needed	Help patients who want to go on Ozempic to access it	No.
A lot more confident about my health being monitored	Not complete	Thank you to the nurses for their prompt response any time my readings might be high
Having to go to the GP less	Nothing	No
Consistent monitoring of blood pressure is reassuring	Nothing	No
Feel very reassured since being accepted on SMILE. Very happy.	Make the service a 7 day monitoring service please	No
Blood pressure and blood sugars are regulated. Happy with the regular phone calls which provide peace of mind	Nothing	No
Blood pressure and blood sugar have improved. I feel happier that I can now keep an eye on them myself	Nothing	No, except that all of the nurses are very nice
Nothing has really improved health wise but reassured that someone is monitoring my symptoms and readings	Nothing	The service provided by SMILE is above excellent. It's like having a nurse in your back pocket. Cannot recommend SMILE highly enough.
Greater awareness of BP and Blood Glucose levels - more informed	No	No
More aware of what normal readings should be	Nothing	No
Delighted with the service, feel that my health is improving	Some issues with the BP cuff but all ok	Not complete
Everything has improved, especially my breathing - no longer need inhalers	Nothing	No
More confidence and happy to have someone to call if needed	Nothing	No
Self monitoring health & symptoms and increased confidence	No	The app keeps logging out
Nurses are staying one step ahead of my symptoms	Do refresher training from time to time	After deployment please call out again after a month to see if the patient is doing everything correctly because deployment can be overwhelming
Overall health	No	No

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
Not complete	Not complete	Not complete
Very happy with the project	Happy with everything. The nurses are great.	Not complete
Peace of mind, reassurance of the back-up provided	Nothing	No
Very happy with the service. Very confident in the help from the nurses and with any IT issues.	Not complete	I hope the service stays in operation for a long time to come
Blood pressure	Not complete	Not complete
More confident about health condition, not as worried.	Weekend service - extend hours	Not complete
Overall health has improved	Not complete	Not complete
I feel safer and more reassured every day	Nothing	No
Overall health	Automatic glucose level uploading	My blood pressure has been regulated a lot better since joining
No	Nothing	Watch had problems from the start
I have organised my diabetes much more	Not complete	I strongly advise SMILE to every diabetic patient
Extremely happy since joining. I am very positive about my health now.	Not complete	I want to thank everyone associated with SMILE and I hope it continues long term.
Consistent blood sugar readings	Nothing	Unsure if the programme is suitable for me, may opt out.
More awareness and control	I need to be more accountable	Excellent service
Control of my blood pressure	Not complete	Brilliant service and I hope it gets rolled out
Overall health. Great to be able to talk to someone about health issues.	Not complete	Not complete
Improved overall health, confidence and ability to self manage illness	Possible weekend monitoring	No
Peace of mind and reassurance from Monday to Friday. Very pleased to have a dedicated team of health professionals available to answer any health questions.	Introduce a comments or notes section on the ProACT app for patients to enter any info they deem relevant on any given day	No
Peace on the mind on the end of the line if I have any health concerns	Possibly introduce a dedicated email service for patients or their carers to submit any questions - rather than requesting a call back please.	No
Happy that the nurses are keeping an eye on things.	Not complete	Not complete
Happy to be able to check readings regularly - increased awareness	Nothing	No
I am more active daily	Not complete	Very happy to be on the project
No real improvements	No	Provide a follow up training session
Peace of mind. Huge compliments to the nurses.	Nothing	Not complete

Tell us one thing that has improved for you since you joined the SMILE service.	Please tell us how we can improve the SMILE service.	Is there anything else you would like to say?
Awareness of someone minding me	Do more advertising, not enough of my friends know about it, who would benefit from it. Consider introducing a charge for people who can afford it in order to expand the service further	No
Reassurance and a sense of being in control	No, very happy with everything	No
More relaxed now, more area of symptoms	Nothing	No
Glucose levels have improved and I am more aware about blood pressure and heart rate readings	Thorough explanation of recording on digital tablet	Thanks for your patience in helping me with connecting to broadband and problems with logging on
My health has improved a lot	Nothing	The nurses are amazing
My awareness of my health on a daily basis	More co operation between SMILE nurses and GPs	Fantastic service
I have been motivated to get more active and this has helped me lose weight	Nothing	Very impressed with the whole service from start to finish
Knowing that there is help readily available if I need it has helped my confidence in dealing with my diabetes	You can't improve on perfection, What the SMILE programme does is working perfectly.	Thank you for all the help and support.
I feel a lot more secure	Happy with the service	Not complete
Confidence	Nothing	Very good
I'm more aware of blood pressure and COPD issues	Tablet battery doesn't last very long	Not complete
Awareness of flare-ups	Nothing	No
Catching infections in time	Nothing	No
Low heart rate, being on programme brought awareness of this	No	No
Not complete	Not complete	Not complete
Not complete	Not complete	Not complete
Not complete	Not complete	Not complete
I am looking after myself now, I realise the importance of self care because of the SMILE programme	Nothing	The nurses are truly amazing
Overall health has improved and we feel more reassured thanks to the consistent monitoring service	Nothing	No
Nothing has really improved	Nothing	No
Keeping more active, more aware of my symptoms, feel more confident and reassured knowing the nurses are monitoring constantly	Nothing	No
Overall health improvement	Nothing	All very positive
Not complete	Not complete	Very happy with the programme

Appendix 8: EQ-5D-5L

Health Questionnaire

English version for Ireland

Under each heading, please tick the ONE box that best describes your health TODAY.

MOBILITY

I have no problems in walking about ❑
I have slight problems in walking about ❑
I have moderate problems in walking about ❑
I have severe problems in walking about ❑
I am unable to walk about ❑

SELF-CARE

I have no problems washing or dressing myself ❑
I have slight problems washing or dressing myself ❑
I have moderate problems washing or dressing myself ❑
I have severe problems washing or dressing myself ❑
I am unable to wash or dress myself ❑

USUAL ACTIVITIES *(e.g. work, study, housework, family or leisure activities)*

I have no problems doing my usual activities ❑
I have slight problems doing my usual activities ❑
I have moderate problems doing my usual activities ❑
I have severe problems doing my usual activities ❑
I am unable to do my usual activities ❑

PAIN / DISCOMFORT

I have no pain or discomfort ❑
I have slight pain or discomfort ❑
I have moderate pain or discomfort ❑
I have severe pain or discomfort ❑
I have extreme pain or discomfort ❑

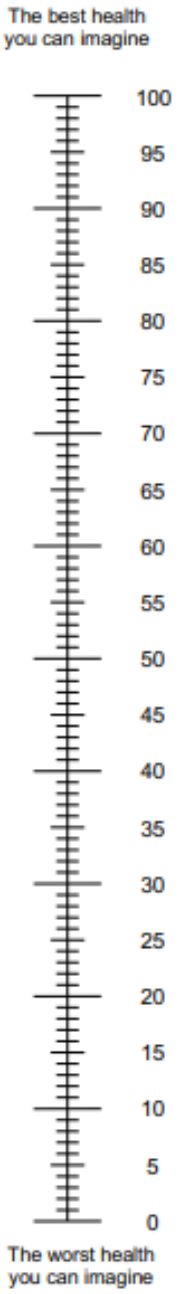
ANXIETY / DEPRESSION

I am not anxious or depressed ❑
I am slightly anxious or depressed ❑
I am moderately anxious or depressed ❑
I am severely anxious or depressed ❑
I am extremely anxious or depressed ❑

Participant ID: _____ Date: _ _ / _ _ / _ _ _ _

- We would like to know how good or bad your health is TODAY.
- This scale is numbered from 0 to 100.
- 100 means the best health you can imagine.
  0 means the worst health you can imagine.
- Mark an X on the scale to indicate how your health is TODAY.
- Now, please write the number you marked on the scale in the box below.

YOUR HEALTH TODAY = ☐



Appendix 9: Guidelines for SMILE 2 project

SMILE2 PROJECT:

SUPPORTING MULTI-MORBIDITY SELF-CARE
THROUGH INTEGRATION, LEARNING AND E-HEALTH

Guidelines for SMILE 2 Project

- **Processes and Best Practice for Caring for Patients with Multi-morbidity**
- **Guidelines on Responses to Patient Alerts**
- **Guidelines on Patient Virtual Engagement**

Version 2
July 2024

Version 2

May 2024

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Sláintecare.

Rialtas na hÉireann
Government of Ireland

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Contents

INTRODUCTION

The SMILE2 service centres on integrated virtual case management of patients with multimorbid chronic disease in the community. It is a joint initiative between the HSE's Enhanced Community Care programme together with Chronic Disease Community Specialist Teams (CD CST) partnering with Caredoc. Virtual case management is provided by experienced triage nurses (SMILE nurses) combined with remote patient monitoring, to support patients with multimorbidity to live more independently and reduce their episodes of deterioration.

This document outlines the processes utilised by SMILE nurses in collaboration with their colleagues in the community setting (chronic disease hubs) to equip patients who have complex care needs to self-manage, by supporting them virtually through episodes of illness and engaging them to maintain their optimal health and wellbeing.

These include:

- Processes and Best Practices for Caring for Patients with Multi-morbidity
- Guidelines on Responses to Patient Alerts
- Guidelines on Patient Virtual Engagement

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1. PROCESSES AND BEST PRACTICE FOR CARING FOR PATIENTS WITH MULTI-MORBIDITY

Introduction and Overview

The SMILE 2 service centres on integrated virtual case management of patients with multimorbid chronic disease in the community. It is a joint initiative between the Enhanced Community Care programme together with specialist chronic disease ambulatory hubs partnering with Caredoc, through the use of virtual case management by trained triage nurses combined with remote patient monitoring, to support patients with multimorbidity to live more independently and reduce their episodes of deterioration.

This service focuses on the integration and expansion of the established SMILE 1 service with the ambulatory care hubs so that the learnings and support from SMILE 1 can be utilised and maximised to further strengthen patient outcomes and enable scale up. Experienced Caredoc triage nurses (SMILE nurses) work in partnership with the chronic disease hub Clinical Nurse Specialists to identify and stratify patients from the population that would need more intense case management support and to provide it in an efficient way through virtual enablement. This document outlines the processes utilised by SMILE nurses in collaboration with their colleagues in the community setting in managing patients with complex care needs to equip them with the knowledge to self-manage, by supporting them through episodes of illness and engaging them with their own health. The SMILE nurse strives to educate patients on symptom recognition through regular virtual engagement, reinforcing key health information while considering the patient's individual health status and circumstances. This ensures access to personalised appropriate at-home care, with the long term goal of reducing the patient's need to utilise unscheduled and/or emergency care during periods of ill-health by raising their ability to recognise when their condition is deteriorating and when they should seek help.

The process for patient enrolment is depicted in the below diagram. Potentially suitable patients for inclusion in the programme are identified by their hub-based Clinical Nurse Specialist, GP, Practice Nurse, CD CST or hospital staff. Once consent has been obtained from these patients to make contact to discuss the SMILE service, the patient is referred to Caredoc to initiate the initial enrolment process. This first stage involves a telephone call interview/assessment from a SMILE Nurse to ascertain that the patient meets the inclusion criteria and to determine what technology/hardware they will need to participate in the programme **(see Guidelines for Receiving, Accepting and Processing SMILE referrals).** An account on the ProACT/NetwellAdmin software platform is created for the patient by the Caredoc Project Officer who will configure the necessary technology and liaise with the Caredoc Field Operator in arranging a suitable time for a home visit to deploy the digital support kit to the patient (see **Process for Setting up Patient Profile & Digital Support Kit** and **Process for Deployment of Digital Support Kit by SMILE Field Operator**).

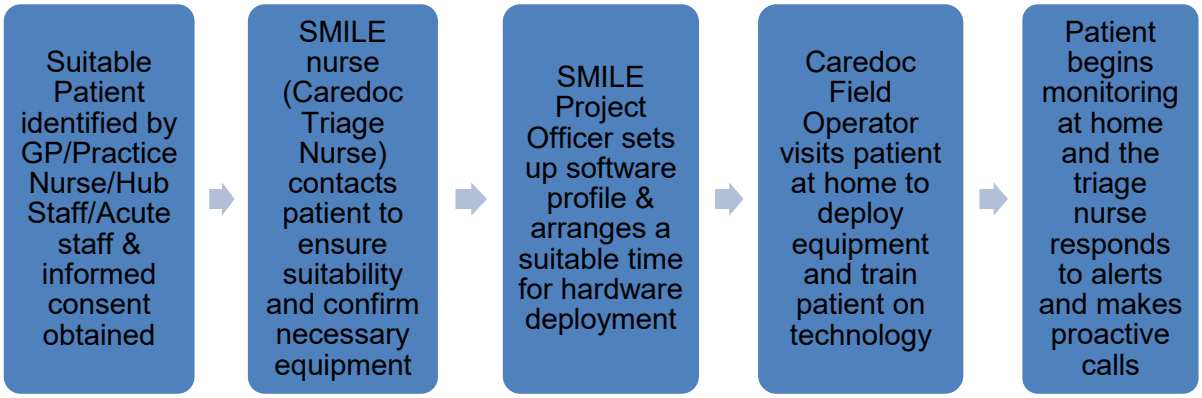

Figure 1 – Process for Patient Enrolment

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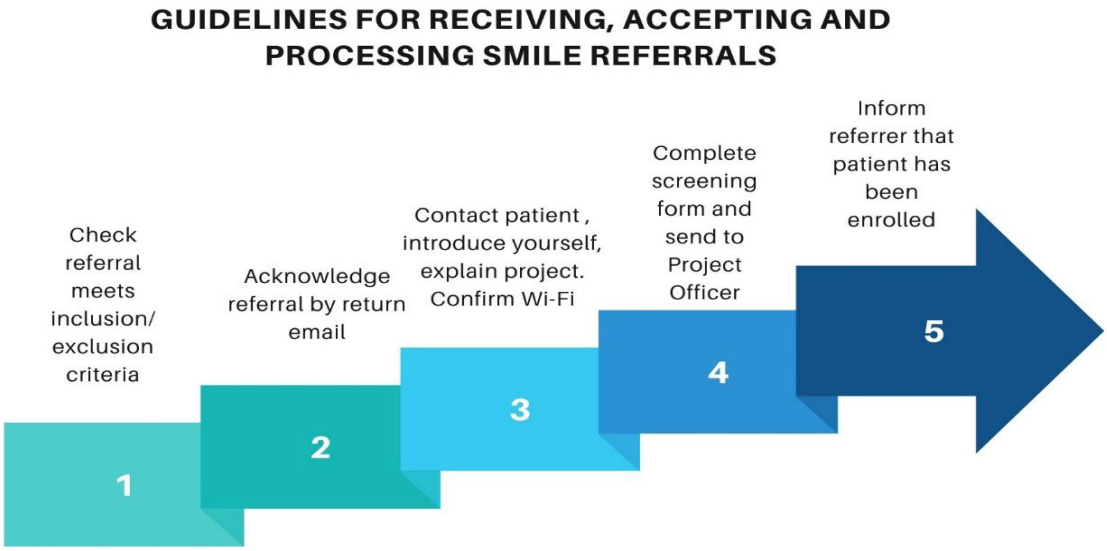
signs of deterioration, the SMILE nurse contacts the patient and assesses the problem. If the SMILE nurse cannot resolve the problem they liaise as appropriate with the clinical nurse specialist in the hub to agree the appropriate steps to be taken, ensuring integration of the services centred on the patient (see **Guidelines on Responses to Patient Alerts**). This allows for early intervention and prevention of further exacerbation of a patient's condition, as well as decreasing the likelihood of the patient requiring an unscheduled Emergency Department visit. This process ensures that care is person-centred and supports patients to proactively self-manage, leading to improved patient outcomes.

1.1 Guidelines for Receiving, Accepting and Processing SMILE referrals

- Referral is received by email to SMILE@caredoc.ie and is reviewed by SMILE Nursing Team
- The SMILE Nurse -
    - Makes an initial check that the referral meets the inclusion criteria **(see Section 1.1.1 SMILE2 Inclusion/Exclusion Criteria**).
    - Acknowledges referral by return email and referrer is informed that a member of SMILE nursing team will make contact with the patient
    - Contacts patient on phone number provided on referral form and speaks directly to the patient where possible
    - Introduces themselves, explains the SMILE service and its goals
    - Confirms that the patient has Wi-Fi as this is necessary to support the technology and software
    - Completes the SMILE screening form with the patient to confirm their
        - Co-morbidities
        - Home address and Eircode
        - Second contact number or landline if possible
    - Informs the patient that outbound SMILE calls will be made from a private/unknown number
    - Informs the patient that a SMILE Field Operator will make contact with them to arrange date and time for deployment of digital support kit and education on how to use same. Their name is given to the patient to expect a call from.

- Technology to allow Healthlink referrals has been enabled so that GPs can refer to the service electronically.
- Documents referral source on the screening form and includes any instructions that may have been provided e.g. baseline vital signs, objectives or goals that have been agreed with the patient
- Sends the completed screening form to SMILE@caredoc.ie and Caredoc Project Officer begins patient registration process
- The referral is acknowledged by adding a green tick to referral email in SMILE inbox to indicate that it has been actioned
- An email is sent to the referrer to inform them that the patient has been enrolled in the SMILE service



1.1.1 SMILE2 Inclusion/Exclusion Criteria

Inclusion Criteria

To be eligible for enrolment, patients must:

- Be over 18 years of age.
- Be living with multimorbidity, i.e. 2 or more of the following chronic conditions:
    - Diabetes
    - COPD/Chronic Bronchitis/Emphysema/Asthma
    - Heart Failure
    - Coronary Artery Disease
    - Cerebrovascular Disease
    - Hypertension

Figure 2 – Guidelines for Receiving, Accepting and Processing SMILE Referrals

If a patient does not meet the SMILE2 inclusion criteria when contacted by a SMILE nurse, they will be informed and an email will also be sent to update the referrer.

- Have access to wireless internet for optimal use of patient digital support kit.
- Have access to telephone/mobile service for receiving calls from the SMILE 2 team.
- Be able to use a device to measure his/her own physiological parameters or have somebody to assist with this.
- Agree to the collection of their data for remote monitoring as well as overall aggregation and analysis for collation of project metrics.

Exclusion Criteria

A patient will not be eligible for enrolment if they:

- Are able to self-manage with ordinary levels of support from GP, Practice Nurse or CNS.
- Are under 18 years of age.
- Are not living with multimorbidity (i.e. lives with less than 2 chronic conditions).
- Do not have access to wireless internet.
- Do not have access to a telephone/mobile service for receiving calls from the SMILE 2 team.
- Are unable to provide written informed consent prior to enrolment.
- Are unable to understand and agree to comply with healthcare advice.
- Are unavailable for scheduled calls from the SMILE 2 team.
- Are unable to regularly engage with the provided technology.
- Are unable to use a device to measure his/her own physiological parameters or have access to assistance with this.
- Are not in agreement with the collection of their data for remote monitoring as well as overall aggregation and analysis for collation of project metrics.

Referrers will be required to exercise professional judgement in selecting only patients with very high need requirements for this project.

1.2 Process for Setting up Patient Profile & Digital Support Kit

This process ensures robust data security and privacy measures for each participant in the SMILE service. While personal and demographic details are recorded on the NetwellAdmin platform for the purposes of patient management, all of the devices or applications supplied to participants will be enabled with generic non-identifiable credentials. A secure email address is configured based on a pseudonymous project ID number for each participant and this is used for registering and subsequently linking third party applications required for data synchronisation and interoperability. Patients participating in SMILE are never asked to provide any personal email addresses or accounts for the use of the digital support kit to ensure safety of their personal health information and associated medical history.

Once a completed participant screening form has been received from a member of the SMILE Nursing Team the Caredoc Project Officer will:

- Assign a Project ID to each enrolled participant, e.g. PXXXX
- Configure a secure email address with a Microsoft Kiosk license based on the participant's project ID
- Register a profile for the participant on the NetwellAdmin system using the secure email address set up for their participant ID, and include their demographic, contact and referrer details as per the completed participant screening form.
- Set their vital sign parameters to standard thresholds to be configured by a member of the nursing team (see **Guidelines on responses to patient alerts**).
- Register a Withings account for the participant using the secure email address provisioned for their participant ID. **Does not add their real name, date of birth or any other personal details to this account as this is 3rd party application**. Connect this Withings account with their NetwellAdmin profile to allow for interoperability of digital support kit with the relevant patient and triage screens and collection of monitoring data from Withings devices.
- Boot a Samsung tablet, connect to Wi-Fi and install the ProACT and Withings applications. Sign in to the applications using the specific email address and credentials. Set up and synchronise a smart watch and blood pressure monitor, ensure they are connected by taking test readings and verifying same under the participant's individual profile on NetwellAdmin. This confirms the necessary connections and required interoperability has been actioned appropriately for collection of data for nurse review. Tag each piece of equipment with the participant's Project ID.
- Prepare a deployment paperwork pack to be provided with the digital support kit and completed with participant at deployment.
- Notify the SMILE Field Operator for the area that the digital support kit is ready for deployment.

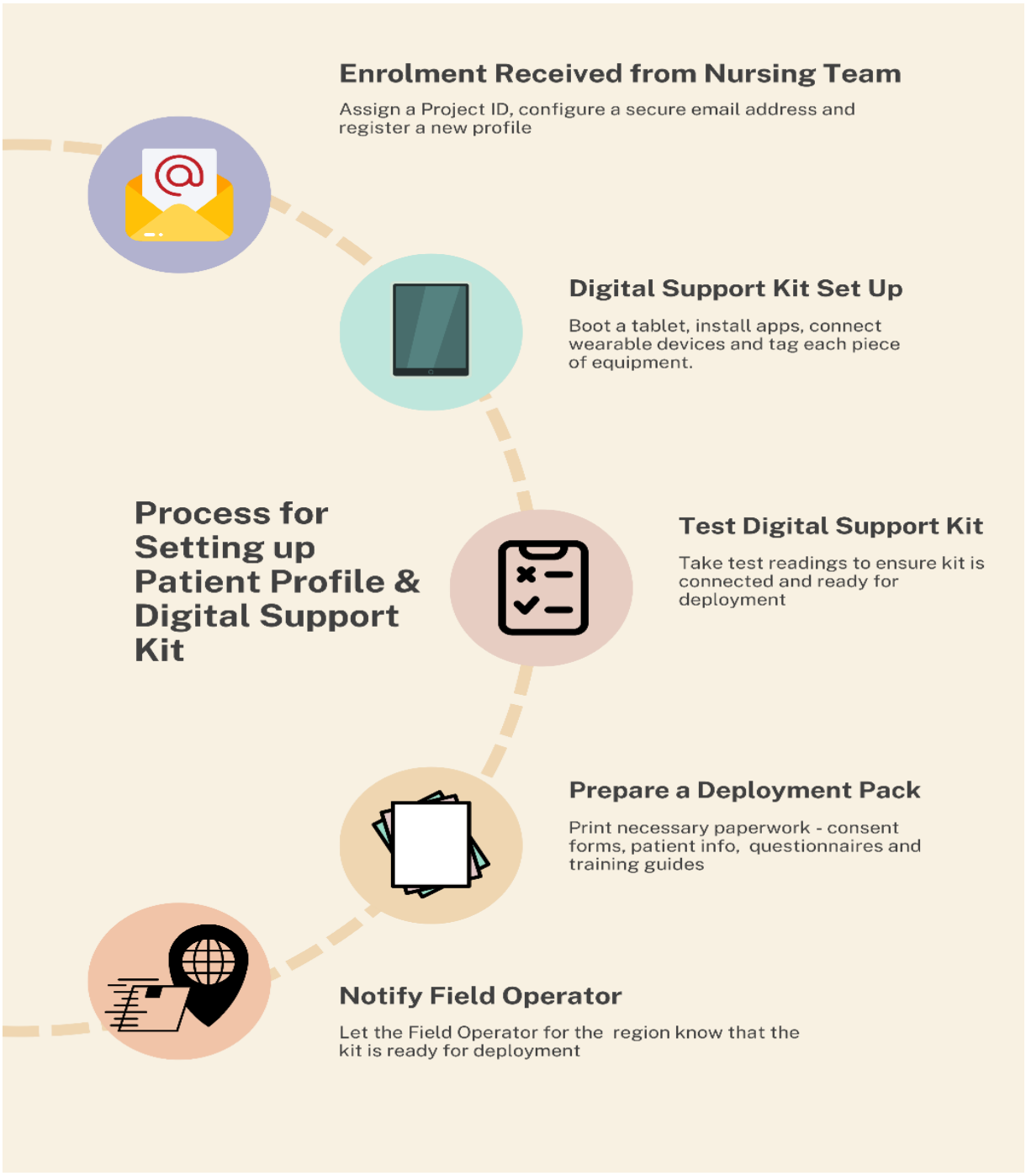


Figure 3 Process for Setting up Patient Profile & Digital

1.3 Process for Deployment of Digital Support Kit by SMILE Field Operator

The SMILE Field Operator will:

- Contact the participant to confirm date and time of deployment and confirm home address
- Confirm the date and time of deployment with the SMILE nursing team so that a welcome call can be scheduled to initiate the patient into the SMILE service.
- **In advance of arranged deployment visit test the digital support kit to:**
    - Check the ProACT and Withings applications are both logged into and are accessible
    - Check that measurement/wearable devices are connected and synchronised to the tablet
    - Check battery levels of all measurement/wearable devices and charge if necessary
    - Perform any Android operating system updates on the tablet if required
- **During deployment:**
    - Connect the tablet to the participant's home Wi-Fi network
    - Demonstrate the functionality of the ProACT application installed on the participant's tablet, including manual input of blood glucose / blood oxygen levels if appropriate and how to complete daily symptom & wellbeing questionnaires
    - Demonstrate taking a blood pressure reading and how to refresh the Withings application to synchronise monitoring data ensuring that this is ported automatically to their ProACT application and is thus visible for nurse review on the NetwellAdmin platform
    - Demonstrate and discuss charging of devices and how often this may be required for each unit individually
    - Ask participant to add / take readings themselves and allow for any troubleshooting or queries that they may have. Complete competency test to ensure that they are proficient
    - Complete required paperwork and questionnaires
    - Advise participant to contact Caredoc main office during office hours on 059 9138199 for any technical problems that may arise

1.4 Guidelines for Welcome Call from SMILE Nurse Following Deployment

- Check the notes for the scheduled call to confirm if it is an introductory call before making contact with the participant
- Speak directly to the participant
- Welcome them to the SMILE service
- Take accurate medical history
- Ensure that a set of baseline vital signs have been taken and recorded. The participant's parameters may have to be adjusted according to their co-morbidities
- Ensure that the patient understands the technology and how to use it. If necessary, discuss the devices and talk through their use – **N.B. this can vary depending on the participant's individual experience of using similar technology previously and may take some time depending on what knowledge they currently have**
- Discuss the participant's care plan
- Explain the schedule of calls
- Explain the schedule of calls following alerts
- Remind the patient that the SMILE calls come from a private/unknown number
- Ensure that the patient has the Caredoc office Number 059 9138199, in order to contact SMILE if any issues arise during SMILE operational hours
- Remind the patient of the operational hours of the service and what to do in the event that they require medical assistance outside of these times - **Outside of office hours the patient should contact CareDoc for urgent GP care or their local Emergency Department if they become unwell**
- Schedule the patient's next call

1.5 Process for Scheduled Outbound Calls to Participants

Outbound calls are made in sequence as per the call scheduling tool included in the NetwellAdmin software. Before a participant is contacted, the SMILE nurse reviews the previous vital sign measurements as well as their previous contact history and will also consider the participant's underlying condition and co-morbidities.

The SMILE nurse contacts the patient by telephone, introduces themselves and outlines why they are calling. The below reference document outlines health coaching steps that should be taken during a routine scheduled call -

1.5.1 Reference Document 005 – Health coaching document

Health coaching focuses on sustainable behaviour change rather than quick fixes aiming for long term success in managing chronic disease.

To assist in achieving this the SMILE Nurse:

- Aims to support patients to make sustainable lifestyle changes that improve their health outcomes and quality of life
- Collaborates with each patient on an individual basis to understand their unique needs and the challenges related to their conditions
- Sets realistic health goals and develops actionable care plans to achieve goals
- Provides ongoing support, motivation and accountability to maintain healthy behaviours such as regular exercise, healthy eating habits, stress management and medication adherence
- Aims to empower the patients with knowledge and skills to take an active role in managing their health and making informed decisions about their treatment and lifestyle choices
- Integrates with their other health care providers to ensure coordinated care and alignment of goals
- Educates patients to identify early detection of a deterioration in their health

Health coaching for patients by the SMILE Nursing team includes advice and education on:

- Medication compliance
- Comorbidities and symptom recognition
- The benefits of increased activity and exercise tolerance
- Following a healthy balanced diet
- Following instructions from their medical team
- Attending medical appointments
- Engaging with self-monitoring and understanding their vital signs
- Understanding the educational component on the ProACT platform
- Sign posting to activities and classes e.g. -
    - COPD exercise classes
    - Discover Diabetes programme
    - Cardiac and Pulmonary rehabilitation

1.6 SMILE Triage Advice for Chronic Heart Failure

Patients may need reminding/reinforcing of advice regarding signs and symptoms of heart failure exacerbation. Medication management, dietary modifications (sodium restriction), fluid intake management, and the importance of regular exercise within their limitations should also be discussed.

Symptom Recognition:

- Increased shortness of breath or swelling, and increased daily weight indicates worsening heart failure. The patient should contact their Heart Failure Team. The SMILE nurse will also follow-up with the Cardiovascular CNS by email.

Measuring and Tracking Vital Signs at Home:

- Hypotension, tachycardia or bradycardia particularly if symptomatic, should be reported by the patient to their Heart Failure Clinic promptly. The SMILE nurse will also follow-up with the Cardiovascular CNS by email.
- Hypertension is a concern but not an emergency.

Medication Compliance:

- Support medication adherence.
- Direct patients to take medication as prescribed. – "If your health care provider has prescribed medication take them exactly as directed".
- Nonadherence to diuretic regime may result in exacerbation of heart failure.
- If the patient has become unwell (e.g.: flu, vomiting, diarrhoea, pyrexia) they should seek advice from their Heart Failure Team during office hours for the purpose of medication titration.

Weight Monitoring:

- The patient is advised to weigh themselves each morning; on rising from bed, similar time, similar clothes, after voiding urine.
- Sudden weight gain, which may indicate fluid retention. An increase of 2kg (4lbs) in 2 days is significant, the patient should contact their Heart Failure Clinic. The SMILE nurse will also follow-up with the Cardiovascular CNS by email.

Fluid Intake:

- Generally, "drink to thirst" is the advice regarding fluid intake.
- But not to exceed 2 litres of fluid in total in a 24 hour period.
- Occasionally individuals with unstable heart failure are advised by their Heart Failure Team to restrict their fluids to 1.5 litres daily and this is reinforced by the SMILE nurse and recorded in the patient's notes.

Regular Medical Check-ups / Appointments:

- Emphasise the importance of attending regular follow-up clinic appointments with their healthcare provider and any necessary specialists to ensure continuity of care.

Outside of office hours the patient should contact CareDoc for urgent GP care or their local Emergency Department if they become unwell.

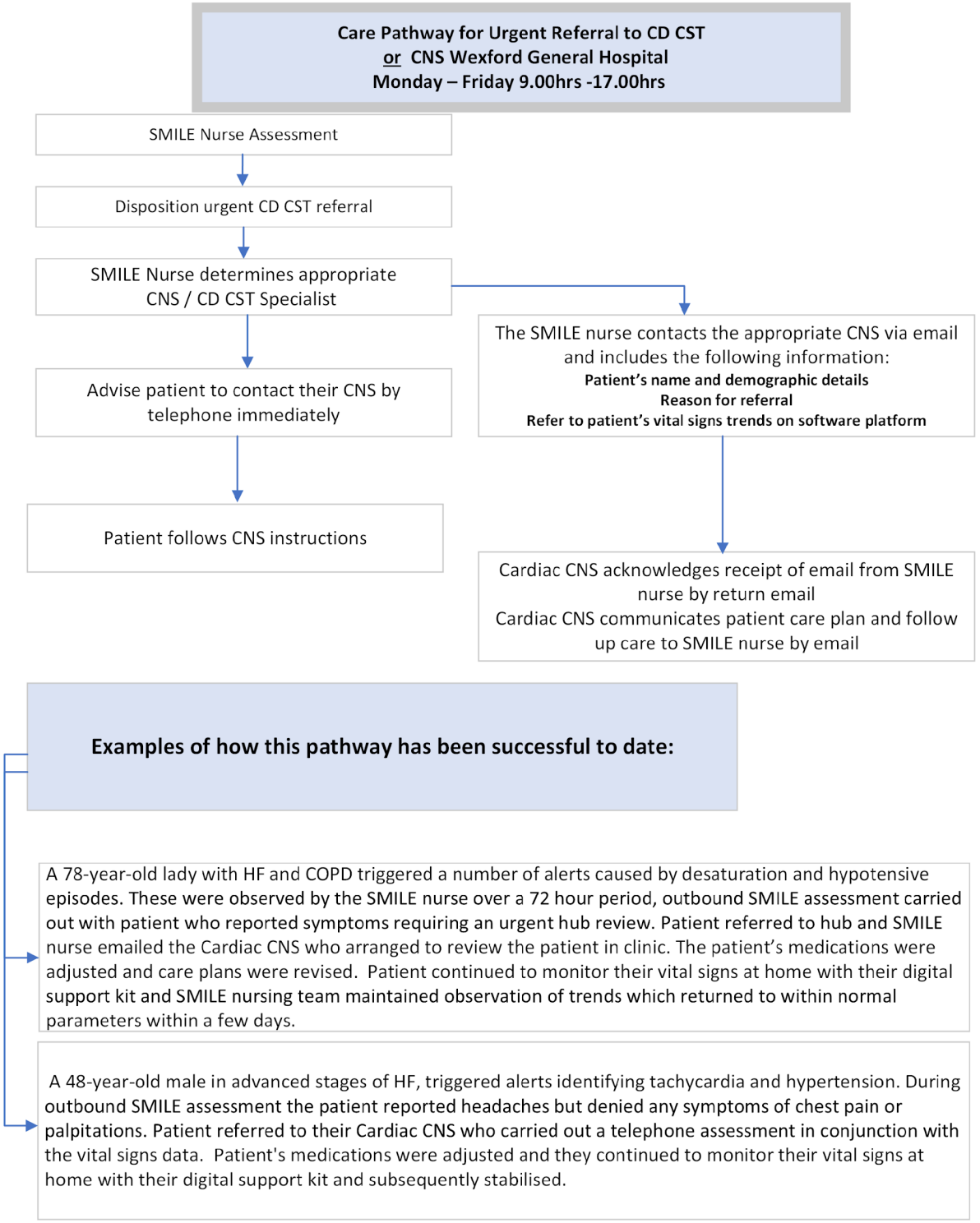
Signposting and Educational Tools:

- Videos and educational components of the ProACT app – e.g. "**Managing Chronic Heart Failure"** produced by European Society of Cardiology
- Irish Heart Foundation: support@irishheart.ie provide support for families and patients, i.e. lifestyle information sessions and online courses
- Information packs available from support@irishheart.ie
- Living well programme. www.hse.ie/livingwell
- www.getirelandwalking.ie
- www2.hse.ie/healthy-eating-active-living

1.6.1 Care Pathways

Significant engagement between CD CST staff and the SMILE team has resulted in the development of care pathways. An example of this can be found below.

Care Pathway for Heart Failure Urgent Referral to CD CST or CNS Wexford General Hospital



1.7 SMILE Triage Advice for COPD and Chronic Asthma

Symptom Recognition (COPD):

- Assess for increased dyspnoea, increased sputum production
- Change in sputum colour
- Chest tightness, and coughing
- Loss of appetite
- Fatigue, loss of energy
- Pleuritic pain or chest tightness

Symptom Recognition (Asthma):

- Evaluate for increased shortness of breath
- Wheezing
- Coughing
- Chest tightness
- If symptoms do not improve the patient should contact their respiratory team/GP
- Outside of office hours the patient should contact Caredoc or their local ED

Measuring and Tracking Vital Signs at Home:

- Monitor for any increase in respiratory rate
- A decrease in their SPO2 level
- Check for fever
- Dyspnoea, +/- exertion
- Tachycardia
- If symptoms do not improve the patient should contact their respiratory team/GP
- Outside of office hours the patient should contact Caredoc or their local ED

Medication Compliance:

- Support medication compliance
- Check medications, including oral steroids, are being taken according to prescription
- Nonadherence to prescribed medication may result in exacerbation of respiratory condition
- Note medication usage, including rescue inhalers
- Encourage correct inhaler technique, www.asthma.ie - inhaler technique video - Asthma Society of Ireland.

Signposting and Educational Tools:

- Educational library available on the ProACT platform.
- Local COPD peer support groups can be found on www.copd.ie or by calling freephone 086 0415228
- COPD and me booklet available from CPD Support Ireland or https://copd.ie/wp-content/uploads/2021/10/COPD-Me-Booklet-2021.pdf
- The following patient resources are available from the Asthma Society of Ireland -
- Asthma Action Plan - https://www.asthma.ie/document-bank/asthma-action-plan-0
- Take control of your asthma https://www.asthma.ie/document-bank/take-control-your-asthma

- Asthma and Hayfever https://www.asthma.ie/document-bank/asthma-hayfever-allergic-rhinitis

Asthma Society of Ireland also provides a patient adviceline for COPD and Asthma. This can be direct patient contact to the adviceline or referral by the HCP. To support healthcare professionals this hay fever season, the Asthma Society of Ireland has recently launched its **new e-referral platform** for healthcare professionals. The platform, available on the Asthma Society website at https://www.asthma.ie/patient-e-referral, allows healthcare professionals all over Ireland to refer patients or carers with questions/concerns about asthma or COPD to the Adviceline.

Outside of office hours the patient should contact CareDoc for urgent GP care or their local Emergency Department if they become unwell.

1.8 SMILE Triage Advice for Type 2 Diabetes

Symptom Recognition (Hypoglycaemia):

- Hunger
- Irritability
- Poor concentration
- Fatigue
- Sweating
- Confusion
- Tachycardia
- Tremor
- Headache

Symptom Recognition (Hyperglycaemia):

- Extreme thirst
- Dry mouth
- Weakness
- Headache
- Frequent urination
- Blurred vision
- Nausea
- Confusion
- Shortness of breath

The patient should contact their Diabetic Team or GP if they are feeling unwell and experiencing any of the above symptoms. Outside of office hours the patient should contact Caredoc or local ED.

Measuring and Tracking Vital Signs at Home:

- Blood sugar levels should be added to the ProACT app on a regular basis, as directed by the patient's Diabetic Team
- Describe how to input this data on the application if the patient needs a refresher

Medication Compliance:

- Support medication adherence
- Nonadherence to diabetic regime may result in a diabetic crisis

Support and Education:

Managing Type 2 Diabetes
https://www.hse.ie/eng/about/who/cspd/ncps/diabetes/resources/education/sick-day-advice-for-adults-managing-your-type-2-diabetes-mellitus.pdf

HSE Advice for Managing Care of Adults with Diabetes Mellitus When They are Unwell

https://www.hse.ie/eng/about/who/cspd/ncps/diabetes/resources/education/advice-for-clinicians-managing-care-of-adults-with-diabetes-mellitus-when-they-are-unwell.pdf

Outside of office hours the patient should contact CareDoc for urgent GP care or

their local Emergency Department if they become unwell.

1.9 SMILE Triage Advice for Type 1 Diabetes

Managing Type 1 Diabetes requires:

- Careful monitoring
- Lifestyle adjustments
- Adherence to treatment plan

Monitoring Blood Sugar Levels:

Self-management means that the patient keeps track of their blood glucose and takes an active part in the treatment of their diabetes. This is important because many daily activities will affect the patient's blood glucose. Patients need to keep a record of their readings and report any unusual fluctuations.

Symptom Recognition (Hypoglycaemia):

- Hunger
- Irritability
- Poor concentration
- Fatigue
- Sweating
- Confusion
- Tachycardia
- Tremor
- Headache

Symptom Recognition (Hyperglycaemia):

- Extreme thirst
- Dry mouth
- Weakness
- Headache
- Frequent urination
- Blurred vision
- Nausea
- Confusion
- Shortness of breath

The patient should contact their Diabetic Team or GP if they are feeling unwell and experiencing any of the above symptoms

Outside of office hours the patient should contact CareDoc for urgent GP care or their local Emergency Department if they become unwell.

1.10 SMILE Triage Advice for Hypertension

Patients need reminding/reinforcing of advice regarding signs and symptoms of Hypertension, as well as advice on medication compliance, dietary modifications and lifestyle changes and the importance of regular exercise within limitations.

Symptom recognition:

- Headaches
- Dizziness
- Shortness of breath
- Epistaxis
- Nausea
- Ringing/buzzing in ears
- Irregular heart rate

Measuring and tracking vital signs at home:

- Hypotension, tachycardia or bradycardia particularly if symptomatic should be reported to the patient's health care provider
- Hypertension is a concern but not a medical emergency

Medication Compliance:

- Support medication compliance
- Take medication exactly as prescribed
- Nonadherence to medications can result in deterioration in patients' health

Regular Medical check-ups/Appointments:

- Emphasise the importance of attending regular follow-up appointments with their healthcare provider and any necessary specialists to ensure continuity of care

Lifestyle changes:

There are some changes that patients can make to their lifestyle that will help to reduce high Blood Pressure.

Some of these will lower the patient's Blood Pressure in a matter of weeks, while others may take longer.

The SMILE Nurses will encourage the patients to:

- Cut salt intake to less than 6 grams a day
- Eat a low fat, balanced diet—include plenty of fresh fruit and vegetables
- Be active as co-morbidities allows
- Reduce alcohol intake
- Lose/maintain weight - Use BMI healthy weight calculator
- Drink less caffeine
- Stop smoking – signpost to HSE's QUIT programme
- Get a minimum of 6 hours sleep a night

Support and Education:

- www2.hse.ie/healthy-eating-active-living/
- www.hse.ie/livingwell
- support@irishheart.ie
- www.getirelandwalking.ie
- www.quit.ie
- Videos and Education component of the ProACT Application

Outside of office hours the patient should contact CareDoc for urgent GP care or their local Emergency Department if they become unwell.

2. GUIDELINES ON RESPONSES TO PATIENT ALERTS

Introduction and purpose

Participants in the SMILE programme are equipped with a variety of connected devices to monitor their vital signs (e.g. blood pressure, heart rate) and wellbeing (e.g. activity levels, sleep). Within the ProACT platform that they are provided access to, vital inputs can be configured to trigger alerts when they are outside of expected thresholds. As an example, when an SpO2 reading below a given threshold is captured by the platform, this will generate an alert for the attention of SMILE nursing personnel. Alerts are monitored daily by experienced SMILE nurses through the ProACT platform's triage web application.

At enrolment participants' baseline thresholds are pre-set as follows –

Measurement	**Low**	**High**
Heart Rate	50 bpm	90 bpm
Blood Glucose	4 mmol	11 mmol
Blood Oxygen	90%	--
Blood Pressure – Systolic	100	150
Blood Pressure – Diastolic	50	90

Equipment is deployed and delivered to each participant by a home visit from a SMILE Field operator. Within 24 hours of equipment deployment to a new participant, the SMILE nursing team schedule a welcome call with them. This ensures that the SMILE Field Operator has completed the technology set-up and that the participant has had time to familiarise themselves with the equipment.

This also helps to establish communication with the participant and the triage team by

- Providing an opportunity for the SMILE nursing team and the participant to become familiar with each other
- Discuss and adjust the participant's alert thresholds if needed
- Discuss the participant's care plan, i.e., how often the SMILE nursing team feels the participant should be monitoring symptoms
- Discuss the operating hours of the service, i.e., 9am to 5pm Monday to Friday, and what a participant should do if they become unwell outside of this time

The SMILE nursing team use their clinical judgment to determine how often and when participants' thresholds should be adjusted and this becomes more apparent to the team as the participant progresses with the service.

Alerts appear on the system almost in real-time, providing that the participant's internet connection is stable. The SMILE nursing team monitor for alerts throughout their working day and will investigate all alerts that are generated on the system, ensuring that all have been reviewed by end of day.

A suite of reference documents are included to provide more detailed information.

The following algorithm explains the steps to be taken when an alert is triggered for a patient in an infographic for ease of reference.

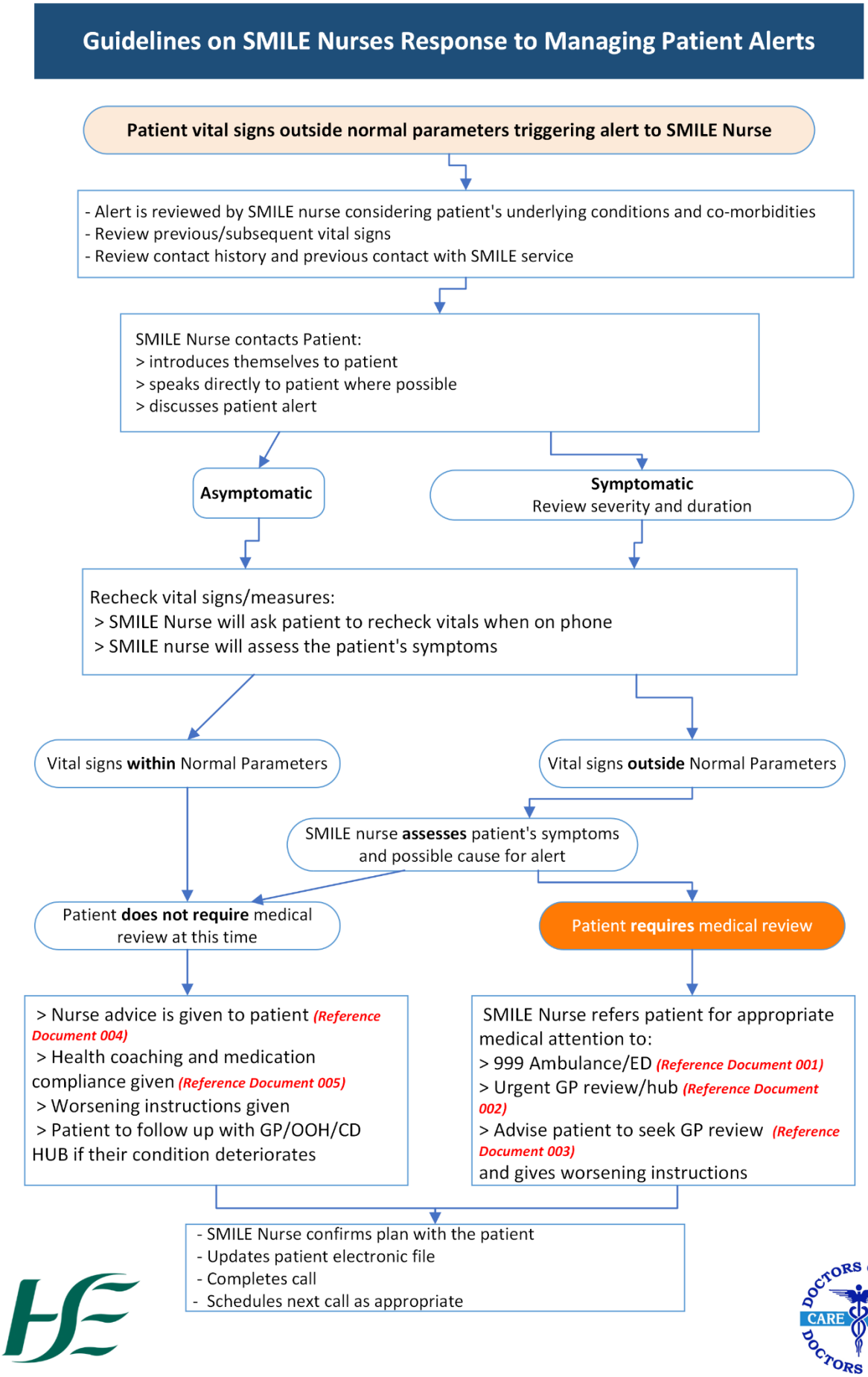


Figure 4 - Response to Managing Patient Alerts

2.2 Reference Documents

Reference Document 001 - Disposition 999 Ambulance/ED

Patient reports 1 or more of the following red flag symptoms - 999 emergency:

Chest Pain with -

- Crushing or burning sensation in chest
- Left sided chest pain radiating down left arm
- Severe shortness of breath, unable to complete full sentences
- Altered level of consciousness
- Pale or grey in colour
- Clammy and sweaty
- Concerned patient/caregiver

Severe Shortness of Breath with -

- Minimal exertion
- Unable to complete full sentences
- Audible wheeze
- Onset of cyanosis
- Pale or grey in colour
- Clammy/sweaty
- Altered level of consciousness
- Unable to rest/sleep
- Worsening resting dyspnoea
- Stridor

Severe Headache with -

- Worst headache ever
- Sudden onset, thunderclap headache
- Severe neck stiffness, unable to place chin on chest
- Photophobia
- Petechial rash
- Signs of stroke – F.A.S.T positive
  - Face (uneven smile, one side of face drooping)
  - Arms (one arm weaker or numb)
  - Stability (dizziness/trouble walking)
  - Talking (slurred words, unable to speak, hard being understood)

Severe Weakness & Lethargy with -

- Altered mental status/confusion
- Sweaty/clammy
- Increased thirst with polyuria
- Rapid breathing/hyperventilation
- Severe epistaxis

Signs of stroke – F.A.S.T positive

- Face (uneven smile, one side of face drooping)
- Arms (one arm weaker or numb)
- Stability (dizziness/trouble walking)
- Talking (slurred words, unable to speak, hard being understood)

Following nurse triage assessment with patient/carer the SMILE Nurse arranges **999 ambulance transfer** to hospital.

Worsening advice and/or first aid measures given.

Advise patient to remain on the line while ambulance contacted and call patched through to the National Ambulance Service.

Protocol for Transferring a Patient to 999 National Ambulance Service (N.A.S.)

- Advise patient/caller that they will be put through to the emergency ambulance service
- Dial 999 and request N.A.S.
- SMILE nurse transfers patient's demographic details to N.A.S.
- SMILE nurse gives brief details of patient's symptoms
- SMILE nurse transfers patient/caller directly to N.A.S. operator
- SMILE nurse stays on line until patient/caller connected with N.A.S. operator
- SMILE nurse disconnects from the call

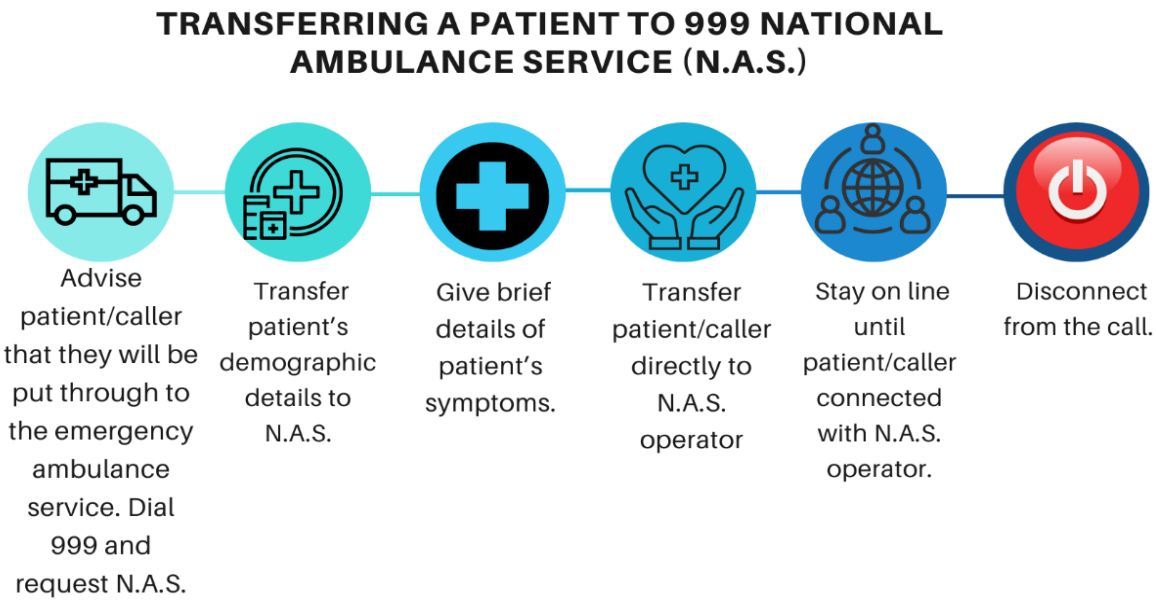


Figure 5 - Transferring a Patient to 999 National

Reference Document 002 - Disposition Urgent GP review/CD CST review if appropriate

Patient reports 1 or more of the following symptoms:

History of chest pain in previous 24 hours with no current chest pain and

- Increased episodes of palpitations
- Increased lethargy/weakness
- Worsening oedema/swelling
- Weight gain
- Moderate shortness of breath

Increased shortness of breath with –

- Pleuritic pain
- Increased episodes of palpitations
- Wheeze
- Cough – dry/productive
- Fever
- Worsening oedema/swelling
- Weight gain

Persistent Headache with -

- Visual disturbance/blurred vision
- Epistaxis
- Conjunctival haemorrhage
- Nausea/vomiting
- Fever
- Worsening lethargy/weakness

Weakness & lethargy with -

- Sweaty and clammy
- Increased thirst
- Dysuria
- Fever
- Anorexia
- Worsening oedema/swelling
- Weight gain
- Increased anxiety

Severe sleep disturbance with:

- Moderate shortness of breath
- Worsening oedema/swelling
- Weight gain
- Cough – dry/productive
- Increased anxiety

Generalised aches and pains with:

- Fever
- Sweaty and clammy
- Cough – dry/productive

Following nurse triage assessment with patient/carer the SMILE Nurse advises the patient to contact GP for review or contact Hub CNS if appropriate.

Worsening advice/first aid measures given.

Advise re: prescription medications and compliance.

Advise patient not to drive and arrange transport.

Reference Document 003 – Disposition Less Urgent GP review

Patient reports one or more of the following symptoms:

Mild muscular chest pain with:

- Low grade fever
- Mild persistent cough
- Mild lethargy/weakness
- Slight shortness of breath

Mild Shortness of Breath with -

- Mild persistent cough
- Low grade fever
- Slight wheeze
- New onset ankle oedema
- Mild lethargy/weakness

Mild Headache with -

- Nasal congestion
- Low grade fever
- Slight dizziness

Mild Weakness and Lethargy with -

- Sleep disturbance
- Generalised aches and pains
- Urinary problems
- Low grade fever
- Decreased bowel activity
- Reduced appetite

Following nurse triage assessment with patient/carer the SMILE Nurse advises the patient to contact their GP for review or contact the Hub CNS as appropriate within the next 1 to 3 days.

Worsening advice/first aid measures given.

Advise re: prescription medications and compliance

Health coaching and education ***(Reference Document 005)***

Reference Document 004 - Disposition SMILE Nurse Advice

Nurse advice as deemed appropriate for the following symptoms:

- Mild muscular pain
- Low grade fever
- Worsening persistent cough
- Increasing lethargy
- Increasing wheeze
- New onset of ankle oedema
- Nasal congestion
- Slight dizziness
- Sleep disturbance
- Generalised aches and pains
- Urinary problems
- Decreased bowel activity
- Reduced appetite

Worsening instructions

- Advise patient to contact their GP surgery if symptoms worsen for appointment
- Advise re: prescription medications and compliance
- Health coaching and education ***(Reference Document 005)***

Reference Document 005 – Health Coaching and Education Document

Health coaching focuses on sustainable behaviour change rather than quick fixes aiming for long term success in managing chronic disease.

To assist in achieving this the SMILE Nurse:

- Aims to support patients to make sustainable lifestyle changes that improve their health outcomes and quality of life
- Collaborates with each patient on an individual basis to understand their unique needs and the challenges related to their conditions
- Sets realistic health goals and develops actionable care plans to achieve goals
- Provides ongoing support, motivation and accountability to maintain healthy behaviours such as regular exercise, healthy eating habits, stress management and medication adherence
- Aims to empower the patients with knowledge and skills to take an active role in managing their health and making informed decisions about their treatment and lifestyle choices
- Integrates with their other health care providers to ensure coordinated care and alignment of goals
- Educates patients to identify early detection of a deterioration in their health

Health coaching for patients by the SMILE Nursing team includes advice and education on:

- Medication compliance
- Comorbidities and symptom recognition
- The benefits of increased activity and exercise tolerance
- Following a healthy balanced diet
- Following instructions from their medical team
- Attending medical appointments
- Engaging with self-monitoring and understanding their vital signs
- Understanding the educational component on the ProACT platform
- Sign posting to activities and classes e.g. -
    - COPD exercise classes
    - Discover Diabetes programme
    - Cardiac and Pulmonary rehabilitation

3. GUIDELINES ON PATIENT VIRTUAL ENGAGEMENT

Introduction and Overview

The SMILE2 service centres on integrated virtual case management of patients with multimorbid chronic disease in the community. It is a joint initiative between the HSE's Enhanced Community Care programme together with Chronic Disease Community Specialist Teams (CD CST) partnering with Caredoc, through the use of virtual case management by experienced triage nurses (SMILE nurses) combined with remote patient monitoring, to support patients with multimorbidity to live more independently and reduce their episodes of deterioration.

The processes utilised in SMILE ensure that care is person-centred and supports patients to proactively self-manage their care, leading to improved patient outcomes. The SMILE nurse reviews the patient's vital signs and engages telephonically on a regular basis with them. In the case of a patient showing signs of deterioration, the SMILE nurse contacts the patient and assesses their current symptoms.

If the SMILE nurse cannot resolve the problem they liaise as appropriate with the patient's GP or with the clinical nurse specialist in the CD CST to agree the appropriate steps to be taken, ensuring integration of the services centred on the patient (see **Guidelines on Responses to Patient Alerts**). This allows for early intervention and prevention of further exacerbation of a patient's condition, as well as decreasing the likelihood of the patient requiring an unscheduled Emergency Department visit. The SMILE nurse also strives to educate patients on their health by supporting symptom recognition through regular virtual engagement and reinforcing key health information while considering the patient's individual health status and circumstances.

This guideline describes how the SMILE nurse utilises technology to support patients with co-morbidity along with nursing support and coaching to empower patients to self-care and avoid unscheduled care visits. This guidance is it based on key principles of patient-centred communication.

3.1 The Role of Digital Technology in Health Care

The technology deployed in the SMILE service ensures that patients receive timely care, as monitoring data generated from the application is available for review in real time. In tandem with this and as part of their digital support kit, participants are provided with access to the ProACT patient platform, which assists in supporting their self-management at home by streamlining and integrating the management of multiple chronic conditions onto a single digital framework. The platform allows users to monitor their symptoms and relevant lifestyle parameters (such as activity and sleep), interact with and share their data, and receive educational support via a digital library of evidence-based patient information materials. Within an individual's application profile this content is personalised depending on the chronic conditions they are registered on the platform with.

This personalisation increases engagement with the SMILE2 programme and the educational aspects of the self-management support offered, as the patient is provided with information that pertains to the conditions that they live with. This allows participants to access suitable content to enhance their knowledge of their illnesses in their own home at a time that is appropriate for them.

The use of digital technology for remote monitoring and case management allows an efficient use of nursing resources by reducing the need for in-person visits, thus allowing for larger caseloads. Health programmes that are delivered virtually are effective in engaging high needs patients at the intensity they require, as services can be tailored to address an individual patient's complexity. The convenience and, if required, frequency of virtual implementation enhances efficiency of a healthcare service as the burden of keeping an in-person appointment and its related difficulties (i.e. transport, cost, time off work, childcare etc) are removed thus ensuring that nursing time is allocated appropriately and as a consequence, there is no wastage of nursing resources from missed/unattended face-to-face consultations. SMILE participants are provided with a visual reminder feature of the date and time of their next scheduled call in their ProACT application. The digital support kit provided to each SMILE participant requires regular interaction for optimal use – the wearable devices are not passive and the frequency of monitoring they require leads to increased engagement with the service in its entirety. In particular, the smart watch supplied by the SMILE service serves as a visual reminder of participation as they are constantly worn by users.

Regular, planned virtual engagement with a healthcare professional can also reduce a patient's dependency on accessing emergency or urgent care by providing early intervention during a period of exacerbation.

3.2 Experience of Staff

3.2.1 CD CST staff

CD CST team provides services for specific episodes of care across three specialities of services for Cardiology (Heart Failure), Type 2 Diabetes and Respiratory disease (COPD and Asthma). Each team consists of a MDT including Integrated Care Consultant, Clinical Nurse specialists and specialist HSCPs.

Each team accepts referrals directly from General Practitioners for patients who require specific episodes of care for their chronic disease.

3.2.2. Experience of Caredoc Telephone Triage Nurses

Caredoc Telephone Triage Nurses are uniquely positioned to deliver the SMILE programme by remote means. They are skilled and experienced in remote assessment having undergone a comprehensive training programme in the GP Out of Hours domain in the specialised field of telephone triage nursing, remote assessment, and clinical decision making.

The SMILE nursing team:

- Are fully trained and experienced telephone triage nurses
- Possess expert clinical knowledge and experience in triaging patients and can identify potentially serious symptoms and life threatening emergencies and can thereby advise on the appropriate level of care based on clinical symptoms
- Have received extensive logistic modular training which provides them with the skills to align the caller to the appropriate healthcare service i.e. General Practitioner, Acute Hospital, Clinical Nurse Specialist
- Possess a wide range of experience in many nursing disciplines
- Possess excellent communication skills

3.3. The Role of the SMILE Nurse

The role of the SMILE Nurse involves -

- Remote patient assessment
- Collaborating with GPs and specialist hub staff to develop the plan of care with the patient
- Systematically assess patient symptoms via their biometric readings and self-reported health and wellbeing information
- Prioritising the urgency of patient needs
- Promoting optimal health and wellbeing by supporting patients to make positive lifestyle changes
- Reassuring patients and increasing their awareness of their chronic conditions
- Empowering patients to take an active role in their health and wellbeing
- Assisting in participant self-management through education, raising the patient's ability to recognise when their condition is deteriorating and when they should seek help
- Advising on additional available health and social care services as appropriate
- Connecting with the patient by engaging virtually with the patient's home environment and social support

- Sustaining engagement with the programme and digital support kit by explaining what the devices measure and what subsequent readings mean
- Addressing interaction requirements for users who are unfamiliar with the technology and escalate as necessary to IT support

Due to the delivery of care through virtual means, the SMILE Nurse can take time to holistically assess a patient's current health status from their digital profile, before making contact with them to initiate a consultation, whether that be to address a system-generated alert (see **Guidelines on Responding to Patient Alerts)** or carry out a scheduled outbound call for the purpose of health coaching. The information available to the SMILE nurse for each participant can range from historic data pertaining to their monitoring of vital signs, to responses to in-built health and well-being questionnaires as well as a full and comprehensive history of all previous consultations carried out by the SMILE team. Review of this data prior to outbound calls supports the holistic approach to care by providing a thorough and contemporaneous overview of the patient's health.

SMILE nurses document pertinent notes at each patient contact and include all significant information that is relayed to them, which ensures continuity of care for the participant and eradicates any requirement for them to have to repeat details of their last CD CST/GP/hospital appointment to another member of the SMILE team, enabling accurate follow-up on any issues or concerns raised during previous consultations.

In tandem with notable health information, the SMILE nurse will also record any important life events conveyed to them by patients, to enable connection with home and family environments, further personalising the patient's engagement with the service and acknowledging the importance of these supports to a person's health. To promote patient-centred care, the comfort of the participant is prioritised during outbound calls to encourage their involvement with the service and allow them to communicate any concerns they may have. The SMILE nurses offer reassurance as well as reinforcing key support messages, which helps to reduce anxiety and stress as the patient gains insight into how to self-manage and where to seek appropriate assistance when needed.

Where goals have been communicated by patients on joining the programme the SMILE nurse will work to reinforce these to promote optimal wellness and will give positive feedback on progress while encouraging healthier lifestyle choices, leading to continued and active participation by the patient.

3.4 Key enablers for virtual engagement with SMILE participants

- Clear patient communication - use simple and jargon-free language to ensure understanding
- Promote patient-centred care
- Prioritise patient comfort, respect privacy, and ensure a compassionate and empathetic approach during interactions
- Use active listening by paying close attention to patient concerns, ask clarifying questions, and demonstrate empathy throughout the consultation

- Sustain patient engagement with SMILE and the digital support kit by explaining what the devices measure and what subsequent readings mean
- Explore goal setting with the participant and reinforce the achievement of small incremental steps towards achieving them by providing check-in points at each patient contact
- Positive reinforcement and encouragement
- Include key family members in the care plan
- Outline follow-up plans, including medication instructions, future appointments, and self-care recommendations
- Follow clear procedures for escalating cases that require immediate attention or in-person evaluation (see **Guidelines on Responses to Patient Alerts**)
- Maintain thorough and accurate documentation of interactions, including patient history, symptoms, and recommended actions
- Follow clinical best practice guidelines

- Collaborate with other healthcare provider as needed, ensuring seamless care coordination for patients (see **Processes and Best Practice**)

3.5 Ensuring Continued Engagement

3.5.1 Health Coaching and Goal Progress

SMILE participants are offered the opportunity to set specific, personal health goals on enrolment, for example, increasing their daily steps or stopping smoking. They often will have discussed this with the member of the CD CST Staff that referred them to SMILE and this information is communicated to the SMILE team at enrolment. If the participant opts for this, the SMILE nursing team will explore with them to further define their goal and set out a feasible plan to support its attainment, in accordance with their preferences. During this process, the SMILE nurse uses active listening to ensure full understanding of any decisions made and joint outcome mapping with the patient provides an opportunity to further promote engagement with their health. The participant's progress in reaching their goal will be documented at each outbound call to facilitate consistent encouragement by the entire nursing team, with positive reinforcement continually offered to increase focus and keep participants motivated. The SMILE nurses use techniques to encourage participation in courses to help achieve goals for example, smoking cessation, weight loss etc.

3.5.2 Technology Support

Some participants can be challenged by the use of the technology for remote monitoring due to a lack of digital literacy and may need additional time and refresher training to ensure that there is no impact on their engagement with the service.

During the initial enrolment call the SMILE Nurse will confirm with the patient if they are routinely a user of digital technology, for example, if they use a smartphone, in order to measure their familiarity with digital devices. The SMILE Nurse will recommend to the participant that they have a friend or family member present for the deployment of their technology, so that maximum knowledge of the functionality can be derived from the visit. At deployment, the SMILE Field Operator will conduct a thorough demonstration with the

participant to make sure that they are comfortable with using the digital support kit. They will also confirm the telephone number and operational hours of the SMILE support team for contact should any issue with their kit arise. Training materials that have been developed by the support team are left with the participant at deployment and there is a suite of instructional videos available in the library of the ProACT app that they are signposted to during their introductory call.

If a participant reports a problem with their kit to the SMILE Nurse during an outbound call, the SMILE Nurse will, in the first instance, perform some basic troubleshooting with them to ascertain the cause. In the case of a simple fix being required, the SMILE Nurse will have the requisite knowledge of the devices and applications to support and advise accordingly. If this basic troubleshooting does not resolve the issue the SMILE Nurse will escalate to the SMILE support team who will contact the patient by telephone in order to perform more in-depth analysis of the problem. If the issue is still not resolved, the SMILE Field Operator for the region will be requested to make contact with the participant directly to schedule a visit to their home to inspect the digital support kit, replace any components if required and offer further training and demonstrations to increase the patient's confidence in using the devices. This ensures continued participation and as little disruption as possible to the use of the digital support kit.